Volume 81
Number 21

IRON TRADE REVIEW

Cleveland, O.
Nov. 24, 1927

Planning an Enameling Shop for high-quality work

How Attention To Details in Layout Helped Us To Achieve Efficiency in Operating a Wet-process Plant on Jobbing Basis

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***DESIGN** and construction of an enameling shop calls for many special features foreign to the needs of the average manufacturing plant. For instance, good natural lighting is a valuable asset and the absence of condensation and moisture is absolutely necessary. The arrangement of sand blast, pickling, milling, dipping, spraying, drying and other equipment requires special care if the enameling operations are to be carried on efficiently. The conveying of work in process demands special consideration.*

All of these factors have been worked out carefully in the design and construction of the jobbing enameling shop described in the accompanying article. The success of the company in handling high-quality work on difficult and unusual ware in the regular line of production is proof of the value of carefully planning the shop and its equipment.

WHEN we set out to organize a company to engage in the manufacture of enameled products, our idea was not to build a shop merely sufficient to do enameling, but rather to create a plant in which high quality work in wet-process enameling could be done economically. We felt that while there already were an abundant number of run-of-mine enameling establishments, there seemed to be a good opening for a shop capable of doing jobbing work of unusual quality. Now that our plant is completed and operating, we feel we have accomplished our purpose.

We have a well constructed brick and steel building of the Austin-type 120 feet wide and 168 feet long. Its arrangement of windows, both in the walls and in the monitors is such that in the first two months of operation it was not necessary to use artificial light during the day. Moreover, due to special features of construction and to the fact there are no cold water pipes overhead, we have had no trouble from moisture settling on the ware. This speaks volumes for the tight construction of the building and for the absence of condensation on windows or pipes.

In planning for the storage of sand, we attempted to avoid unnecessary handling and to guard against moisture. Therefore we built a concrete bin inside the building but so situated in relation to the railroad siding that the sand can be unloaded quickly and easily from a box car. Once the sand is in the bin, it does not collect moisture. Thus far our handling costs have been low and we have had no trouble with wet sand—a fact that has contributed to the smooth operation of the sandblast department.

The pickle room has exceeded expectations in point of production inasmuch as it has been necessary to operate the department only five hours a day in spite of the fact the furnace has been going 10 hours daily on sheet steel. We attribute this showing to methods as well as to equipment.

Convenient Arrangement of Equipment Is Evident in the Various Departments in the New Plant of the Louisville Enameled Products Co.

A double-strength cleaner is being employed which has proved highly satisfactory. No rusting has occurred nor have any of the usual difficulties with ground coat been encountered.

Two venturifin steam units are installed in the walls of the pickle room to eliminate vapor. The pickle dryer has open exposed gas burners, which are operated only during the time the basket of ware is in the dryer. The dryer has no covers or hearth plates. Large baskets of monel metal are used which permit us to double-deck the pieces and thus handle twice the average amount of ware.

Mills at Convenient Height

In the mill room the mills are set so that the valves clear the floor by about 36 inches. This permits a 33-gallon can to be placed underneath for unloading. The cans are equipped with rollers so that they can be moved from the mills easily. Smaller cans holding about 100 pounds of frit are used for loading the mills. Each mill is direct-driven, an arrangement that has proved highly satisfactory. The floor of the mill room slopes away from the center to the two sides, facilitating the flushing of the floor with water. The equipment also includes two 25-pound laboratory mills which are almost indispensable in a shop where many colors are used as in ours. The dipping tank is designed to afford ample production on flat sheets, yet is adapted to boxes and bulky shapes. When flat sheets are being dipped, the revoloving rack is set on top of the tank and the dipper hangs the ware on this board so that it will drip back into the tank. After he has filled one side of the rack he turns it around and loads the other side. At the same time a helper removes the ware from the other side and places it in the dryer. When boxes are being dipped, the draining rack is removed.

Two of the spray booths we installed are 8-foot booths with two pedestals each. The intention was to supply the sprayer with work so that all of his time would be devoted to spraying. A helper loads and unloads the pedestals, while the sprayer, using one gun, merely steps back and forth from one to the other. This method is the best we have discovered for attaining high production and assuring good inspection.

After the ware is sprayed it is carried into the dryers by carrousal conveyors. A hurricane dryer, 40 feet long, is used. Air which is heated by steam to 190 degrees Fahr. is blown through a duct in the bottom of the dryer at the rate of 3000 feet a minute. Although the steam pressure varies at times from 10 to 15 pounds per square inch it always is possible to keep the temperature up to at least 170 degrees Fahr. The speed of the conveyor is changed from 15 inches to 5 feet a minute, yet the ware is not cracked and always is dry when it comes out. A small room-type dryer, which is heated by radiation from the main dryer, is used for storing cleaned castings and for other miscellaneous drying needs.

Boilers and air compressors are in the basement so that the dirt and oil may be kept out of the main shop. One compressor has sufficient capacity for the needs of the entire plant including the sandblast equipment while the other is of such size as to take care of the shop when the sandblast is not operating.

One of the outstanding features of the shop is the 5 x 12-foot, box-type furnace built by the General Electric Co. It has top and bottom elements, but no heating units on the sides. The connected load is 340 kilowatts on a 220-volt line.

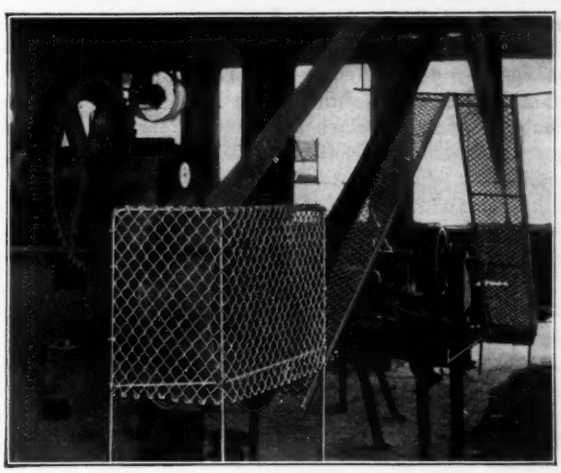
We are burning cast iron ground coat at 1360 degrees Fahr. and the cover coat at 1300 degrees. At these temperatures the forks are double-decked and the furnace loaded right up to the door, the ware being burned in a maximum period of 16 minutes. Cast iron white is handled satisfactorily in one ground coat and one cover coat and many of the colors in one coat direct on the metal. Cast iron ware is burned at night and sheet ware during the day. The temperatures for the latter are 1580 degrees for the ground coat and 1520 for the cover coat. No warping is experienced, although we are burning entirely up to the door and setting the furnace for 2½ minutes for white and 4 minutes for ground. By using long point bars, long narrow pieces can be placed between the points, thus obtaining twice the footing in one burning than if the sheets were flat on the points.

One of the interesting jobs now in the shop is a cast iron meat chopper weighing about 50 pounds. Heretofore this work has always been handled by the dry-coat process. The thickness of the casting varies from 3 inches to less than ½-inch, yet the job is being put through in the regular line of production.

The furnace is turned on at 7 o'clock Monday morning and at 7:25 it is up to sheet metal heat, at which time the day's production on sheet ware is commenced. At the end of the shift, the controls are set for cast iron burning and by the time the night force arrives the furnace is ready for cast ware.

Numerous minor refinements have been found invaluable in aiding production. For instance the position of the furnace was reversed so that the burners have the benefit of daylight on the forks. Also, the conveyors carry the ware right up to the forks so that there is no lost motion in handling. These details, coupled with the convenient arrangement of all the equipment, are responsible for production economies, which prove the importance of carefully planning a shop before it is built.

Highway Chain Guard Affords Protection



THIS illustrates an operating "kink" that may find application in many shops. At the plant of the Dominion Chain Co., Niagara Falls, Ont., workmen are shielded from flying belts, whirling pulleys, and dangerous gears by an improvised guard made from pipe, angle iron and pieces of chain link highway guard. The guard was manufactured by the Page Steel & Wire Co., Bridgeport, Conn. According to the Dominion plant superintendent the guard is well adapted to the needs of the workmen in that it does not obstruct light and does not hide wearing parts that might need attention. It also is inexpensive.

Selecting the Strongest Steels for Bridges of Long Span

Silicon Steels Find Greatest Popularity with the Acid Process Preferred Because of Purity of Product—Better Testing Is Urged

BECAUSE of the increasing number of long span bridges which have been built in the last few years, attention has been focused upon the question of the most suitable types of steel to be used for the structural members. In the interest of gaining further information on bridge construction and on the selection of the maximum strength steels, the New York chapter of the American Society for Steel Treating recently had several prominent consulting engineers, research engineers and metallurgists discuss various phases of the subject.

Leon S. Moisseiff, consulting engineer in general charge of the erection of the Hudson River bridge from Fort Washington to Fort Lee, New York, discussed the requirements of and the materials entering into the construction of the modern long span bridge. He praised the qualities of silicon steel, which came into use on big bridge construction around 1915 and which he said has been favored by builders of long span bridges ever since. The relative cheapness of silicon steel was referred to as one of several things to be said in its favor. The speaker said that this steel can be had at a price within approximately one cent per pound of the cost of carbon steel and not infrequently at less.

Discussing heat-treated steel bars, the speaker declared that a more reliable method of testing these bars should be evolved. Each bar is tested separately and while these tests are satisfactory insofar as they apply to the individual bar, they do not provide definite assurance as to the quality of the untested bars.

Mr. Moisseiff appeared doubtful as to the quality of heat-treated steel wire. Heat treating of wire has only recently been proposed and he believed that time only can determine the effects of this treatment on wire. There is a need for more reliable castings, with more exhaustive tests to assure the bridge builder of their behavior. He believed that the long span bridges, which will be built in the future, will be mostly toll bridges and largely for highway purposes.

H. C. Boynton, metallurgist, John A. Roebling's Sons Co., Trenton, N. J., builder of the Brooklyn bridge and many notable structures since, advocated the use of acid steel for suspension cables. He said that tests made on acid steel cables installed years ago show no important changes in properties. He prophesied that bridges such for instance as the Brooklyn bridge with its acid steel suspension cables, would stand up for 500 years, and more likely for 1000 years. The acid steel first used by the Roebling company came from Sweden.

Comparing acid with basic steel, Dr. Boynton asserted that the acid steel was freer from slag and oxide, freer from gases, has higher tensile strength and greater uniformity in its various properties. Fatigue usually is to be found at slag and oxide inclusions.

Steelmaking Requires Care

A. V. De Forest, research engineer, Page Steel & Wire Co., Bridgeport, Conn., which made the wire cables for the Philadelphia-Camden bridge, believed that if care is taken in making the steel, there is little to choose between basic and acid steels. He pointed out, incidentally, that basic steel is now used extensively in the manufacture of watch springs, which before the war were made largely of Swedish acid steel. He discussed the properties of bright, galvanized and tool steel wire, numerous lantern slides being shown by way of illustration. Difficulties involved in the manufacture of special steels for bridges were outlined by H. T. Morris, metallurgist, Bethlehem Steel Co., Bethlehem, Pa. which manufactured and erected the steel in the Philadelphia-Camden bridge. Following the trend of the discussion opened up by some of the previous speakers, he asserted that if all steel for bridges was acid instead of basic, there would not be enough to go around. At the same time it probably would be too expensive.

In addition to the production problems involved in the manufacture of special steels, Mr. Morris discussed various economic phases, touching upon the equipment required, the greater percentage of rejections as compared with the ordinary run of commercial steel and the difficulties in disposing of this rejected steel. Broadly speaking, there is nothing to be done but to scrap these rejections. There are also fabricating problems involved which add to the high cost of special steels, he inferred.

Nickel steel, used at one time to a greater extent than at present in building large bridges likely will find increasing usage, particularly in the construction of cantilever and arch bridges, according to Clement E. Chase, Modjeski & Chase, consulting engineers, Philadelphia. Mr. Chase was principal assistant engineer in charge of construction of the Philadelphia-Camden bridge. He believed that nickel steel was especially advatageous for the heavier types of bridges, however, he admitted that the premium on nickel steel—something like 24 percent over silicon—was a handicap, and said that this higher price is due not only in part to the material cost but to cost of manufacture as well.

Marine Diesel Efficient

In the sea trial of the freighter SEMINOLE, the first large American made M.A.N. type of diesel engine, proved its merit and went into service. The ship attained a speed of 14 knots, which is a record for this class of vessel. At a speed of 115 revolutions a minute the new diesel engine developed 3680 horsepower. The boat was exceptionally free from vibration and the fuel oil consumption averaged about 100 gallons per hour at full speed. The engine was built at the Hamilton, O., plant of the Hooven, Owens & Rentschler Co. under license from German interests.

Four sea-going barges operating on the Warrior river from the Birmingham, Ala., district via Mobile and New Orleans, to Houston and Galveston, Tex., are carrying steel products from Birmingham for distribution in the Texas fields.

Practical Features of Pickling

by WALLACE G. IMHOFF

Third Article—Facts About Iron Oxides and Scale

THIS is the third of a series of articles on pickling processes written exclusively for Iron Trade Review. The first article appeared in the Oct. 27 issue. Succeeding articles will discuss the acids used, construction and arrangement of tanks, chemical reactions, fumes and ventilation and plant design.

PICKLING requires some knowledge of the kind of iron oxide or scale to be removed. So many iron oxides and scales are encountered in the fabrication of various iron and steel products, that a complete classification is difficult to make. Various components include iron, oxygen, temperature, water, pressure, oxidizing and reducing atmosphere, time and mechanical action.

The grouping and arrangement of the components under one set of conditions has produced the iron oxides, iron minerals, or iron ores in their natural state; the grouping and arrangement of the components in a different manner produces soaking pit, roll, hammer, mill, annealing, tempering, and forging scale.

The relation that the components bear to each other and to the whole, is exemplified by one of the most common iron oxides, namely rust. The common form of rust is an iron oxide of a long continuous series which has on the one end a bright yellow iron oxide formed in the bottom of streams of water carrying iron; and on the other end a deep blue iron oxide formed at high temperatures without the presence of any water.

A few things of extreme importance are to be noted. First, color change in the iron oxide is a temperature indicator, yellow at the low end with excess water, and blue at the high end with no water at all. Second, rust is just one iron oxide of this long series of iron oxides, the composition of which is represented by the root Fe_2O_3. Third, water reaches its maximum on the low end of the series but is entirely absent in the blue oxides at the high end of the series. Fourth, there is an ever gradual change in the influence exerted by any individual component depending on the conditions of equilibrium reached at that particular time. Fifth, with the change of conditions, the influence of the individual components change, and also the characteristics of the iron oxide.

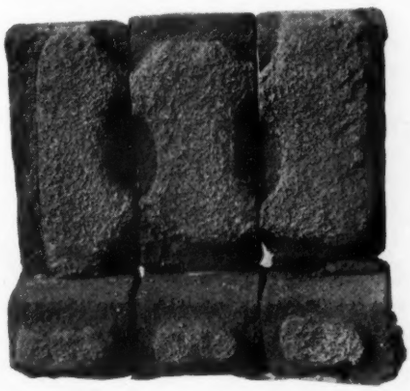


FIG. 6—IRON ORE AFTER IT HAS PASSED THROUGH A FURNACE AT A TEMPERATURE OF 3500 DEGREES FAHR. THE OXIDE WAS A YELLOWISH BROWN BEFORE ENTERING AND A NAVY BLUE AFTER LEAVING THE FURNACE

The field work of many geologists and the laboratory work of R. B. Sosman and J. C. Hostetter, E. Posnjak and H. E. Merwin, and others have shown that the iron oxides rarely occur in pure form in nature. They form a series containing varying amounts of Fe_2O_3, FeO, and H_2O and may be grouped as Magnetite-hematite Fe_2O_3. FeO. Fe_2O_3; Hematite-goethite Fe_2O_3. Fe_2O_3. H_2O; and brown Ores Fe_2O_3. H_2O, $Fe_2O_3 \pm H_2O$.

The iron oxide series is explained clearly by J. M. Camp and C. B. Francis in "The making, Shaping and Treating of Steel" as follows:

"Hematite group: The typical mineral of this group is hematite which contains the equivalent of 70 per cent metallic iron, based on the chemical formula Fe_2O_3. It furnishes the base of the world's most important ores.

"Limonite or brown ore group: The minerals of this group are all hydrous ferric oxides, and may be represented, as a group, by the general formula m Fe_2O_3. n H_2O. There are five of these minerals, and they have been named, in the order of their progressive increase in water content, turgite, 2 Fe_2O_3. H_2O; goethite, Fe_2O_3. H_2O; limonite, 2 Fe_2O_3. 3 H_2O; xanthosiderite, Fe_2O_3. 2 H_2O; and limnite, Fe_2O_3. 3 H_2O. On a theoretical basis the iron content of this series

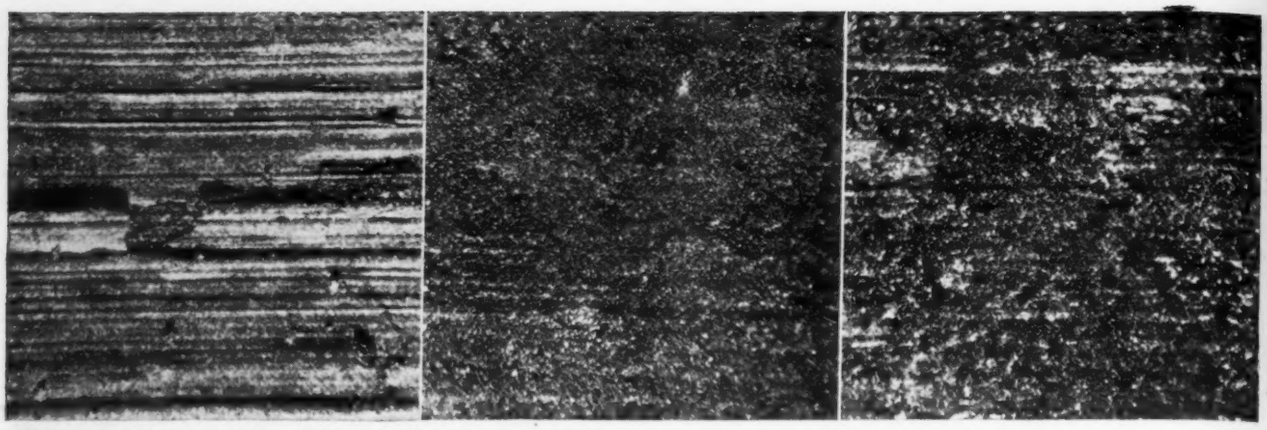


FIG. 7 (LEFT)—SCALE ON OUTSIDE SURFACE OF A SHEET. DEEP SCRATCHES WERE MADE BY THE ROLLS. FIG. 8 (CENTER)—STEEL SHOWN IN FIG. 7 AFTER HAVING BEEN PICKLED 1 MINUTE. FIG. 9 (RIGHT)—STEEL SHOWN IN FIG. 7 AFTER HAVING BEEN PICKLED TWO MINUTES

will vary from 52.31 to 66.31 per cent."

The old Lake Angeline iron ore on the Marquette iron range was a blue oxide. It was surrounded by volcanic rocks and therefore was at a high temperature. The iron oxides of the middle horizons are red hematites which color indicates a lower temperature, and the limonites found near the surface indicate more of ordinary atmospheric conditions.

If some of these iron oxides in the form of a moist yellow brick are placed in a furnace and heated to a temperature of 3500 degrees Fahr. they will emerge a deep blue iron oxide. This is shown in Fig. 6. One component, namely pressure, is lacking.

Scales Are Compared

But what relation does this have to scale? Consider the buttweld tube with its blue scale; the components of iron, oxygen, high temperature and no water, are important in both instances. It is to be noted water is not present in either case. Consider deep blue scale on ingots in the soaking pits, the same as the blue iron ore or iron oxide after passing through the furnace, only more compact. Consider the blue scale found on forgings the same as the iron ore after it has gone through the furnace. And so the endless blue scales or iron oxides are formed at high temperatures, with no water, in an oxidizing atmosphere, with the principal components being plenty of easily available iron, oxygen, and high temperature.

Whether the iron oxide is compact or not depends on the pressure and the influence of other components near at hand. Silica has a strong attraction for Fe_2O_3, and in combination with iron oxide gives a dense blue silicate at high temperatures. In order for this iron silicate to be stable there can be no reducing component available, otherwise at high temperature these two components would be reduced. Blue scales, are scales that are iron oxides formed at high temperature without the water component being present. The color indicates the temperature. This same blue scale, Fe_2O_3 is converted into rust (m Fe_2O_3. n H_2O) a dark brown to yellow color, if the steel is left out in the weather. This feature has been recognized by many steel companies as an aid to pickling in converting the almost insoluble magnetic oxide of iron into rust by allowing the steel to be exposed to the weather from three weeks to six months so as to change the scale into a form more easily pickled.

Temperature Differs

Annealing scales are soft red or blue scales. The red scales are formed at low temperatures and the blue scales at high temperatures. The component, water, is absent. The blue scales contain the most oxygen and the most iron. As the temperature falls to where the red oxide is produced the oxidation process is somewhat retarded. Finally at atmospheric temperature oxidation goes on slowly. The component water also is present and the iron oxides assume colors ranging from deep dark brown with a small amount of water to bright yellow with an extreme excess of water.

The second series of iron oxides and scales is that of the magnetic oxide series, Fe_3O_4 (Fe_2O_3. FeO). This

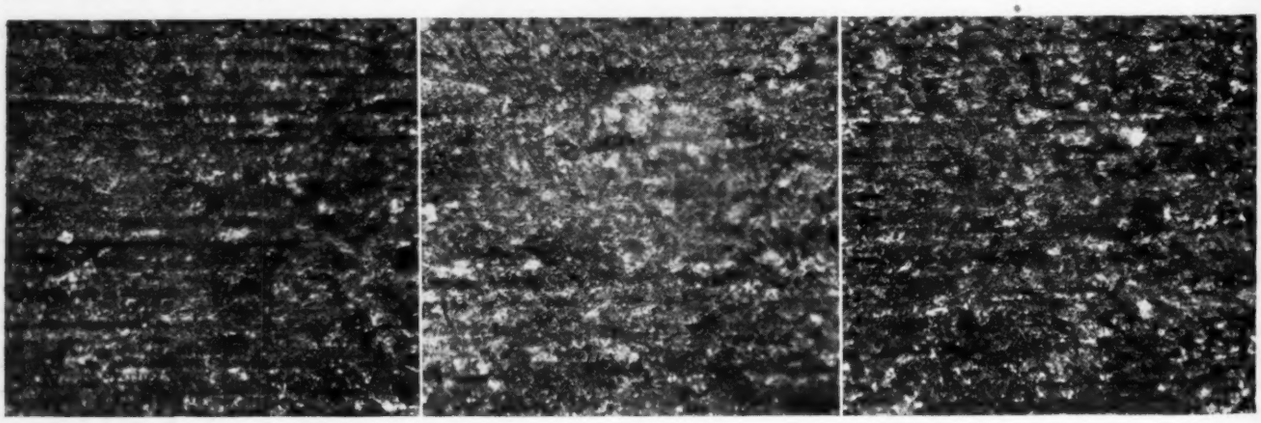


FIG. 10 (LEFT)—STEEL SHOWN IN FIG. 7 AFTER HAVING BEEN PICKLED THREE MINUTES. FIG. 11 (CENTER)—STEEL SHOWN IN FIG. 7 AFTER HAVING BEEN PICKLED FOUR MINUTES. FIG. 12 (RIGHT)—STEEL SHOWN IN FIG. 7 AFTER HAVING BEEN PICKLED FIVE MINUTES

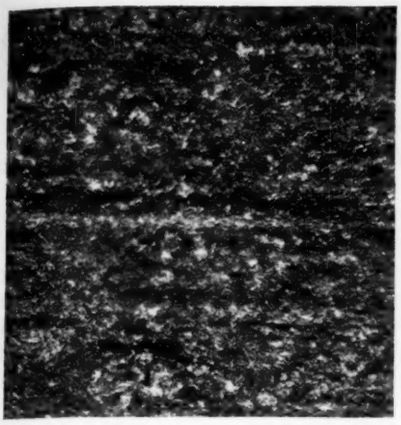


FIG. 13—STEEL SHOWN IN FIG. 7 AFTER HAVING BEEN PICKLED EIGHT MINUTES

series is developed in the rolling mills under the following conditions:

1. Iron, abundant supply.
2. Oxygen, retarded oxidation.
3. Water, abundant supply.
4. Temperature, medium high; falling.
5. Pressure, from rolls, variable.
6. Time.
7. Mechanical action, exposes new surfaces.

The scale from the ingots in the soaking pits is a heavy blue scale; conditions, temperature rising, iron, accelerated oxidation, no water, and no pressure. As soon however as the ingot enters the roughing rolls the conditions change. The ingots are broken down, drawn out, flattened, etc. under heavy pressure with streams of water cooling the rolls and washing the scale off the blooms, billets, or slabs. In the slabbing mills where the surface area is larger the action is more pronounced. This black magnetic oxide is extremely hard and puts grooves and scratches in the rolls. The water is run over the rolls not only for cooling purposes, but to wash this hard scale off the bloom, or billet before it enters the rolls. Various means have been used to remove a part of the scale which arises during the rolling process. In addition to the use of water on the steel, chilling to raise scale, flooding at various passes with high-pressure water, use of steam, rock salt, etc. Even different ways of turning the blooms, billets, etc. have been tried. Slabs are set on edge for certain passes to crack off the scale by a slight reduction in area. For products where the surface is of extreme importance, billets and bars are pickled, and in the case of the manufacture of certain grades of automobile sheets, breakdowns also are pickled.

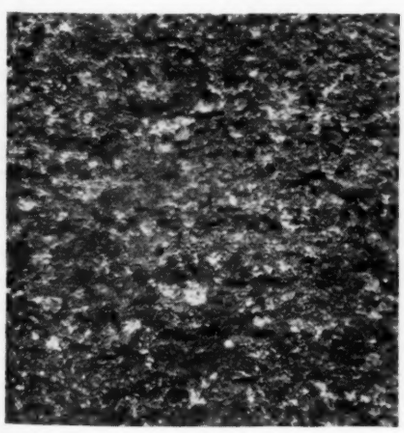


FIG. 15—STEEL SHOWN IN FIG. 7 AFTER HAVING BEEN PICKLED 20 MINUTES

Two Components Present

From the blooming mills the steel enters the semifinished stage of blooms, billets, sheet bars, and slabs. The semifinished product goes to the finishing mills where it is rolled into shapes such as beams, channels, angles, spilce bars, etc.; or to the rail mills, the pipe mills, the sheet and tin plate mills and so on through the long list of finished steel products. In all these mills two components are prominent namely, pressure and water. The temperature is low compared to that which is present in the blue oxides of the Fe_2O_3 series. It is a cooling process. New and enlarged surfaces continually are being exposed to the drastic cooling effect of running water and air. The general conditions present tend to slow down and hinder the chemical reactions producing iron oxide. There is therefore more iron (magnetic oxide, Fe_3O_4, contains 72.4 per cent iron, while hematite, Fe_2O_3, contains 70 per cent iron) and less oxygen. The magnetic oxide indicates a slowing down of chemical action, a decreasing amount of oxygen, and a lowering of temperature. The Fe_2O_3 series indicates an increased temperature, a speeding up of chemical action, and an increase of oxygen entering into combination with the iron.

The chemical composition of roll scales, magnetic oxide Fe_3O_4, from some of our modern steel mills follows:

Name	Dry Iron %	Nat. Iron %	Phos. %	Moisture %
Syracuse	72.00	70.38	.....	2.25
Camden	71.70	70.26	.....	2.00
Columbia	61.50	59.96	.....	2.00
Northumberland	65.30	63.99	.....	2.00
Butler	68.40	67.03	.....	2.00
Aliquippa	70.50	69.80	.....	1.00
McKeesport	71.60	70.17	.....	2.00
Auburn	71.00	70.29	.....	1.00
Wickwire	72.00	70.56	0.03	2.00

As is readily seen, the larger the surface area produced in rolling operations the greater the amount of scale formed, since more surface area is exposed to oxidation. The rolling operations in the steel mills produce the magnetic oxide of iron, roll scale, Fe_3O_4. The magnetic oxide of iron is but slightly soluble in sulphuric acid and for this reason the outside sheets of the pack are hard to pickle.

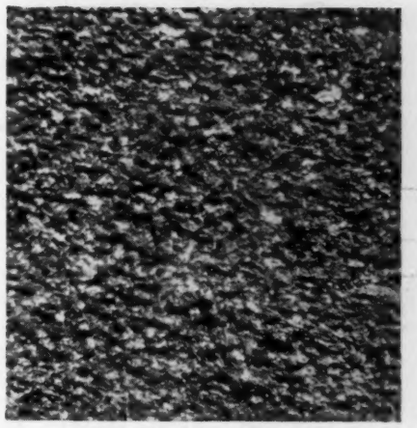


FIG. 14—STEEL SHOWN IN FIG. 7 AFTER HAVING BEEN PICKLED 15 MINUTES

Fig. 7 shows the scale on the surface of a piece of a one-pass cold-rolled sheet. Note the large grooves and the scratches from the rolls.

Fig. 8 shows the surface after one minute pickling in 4 per cent sulphuric acid at 150 degrees Fahr. The scratches can be seen crossing the surface.

Fig. 9 shows the same surface after two minutes pickling. The scratches can still be seen. The scale is not all removed.

Fig. 10 shows the same surface after three minutes pickling. The deep furrows can be seen plainly.

Fig. 11 shows the same surface after four minutes pickling. In addition to the roll marks the grain structure is beginning to appear.

Fig. 12 shows the same surface after being in the pickle five minutes. The grain structure now can be seen painly. Practically all the scale is gone.

Fig. 13 shows the surface after being in the pickling solution eight minutes.

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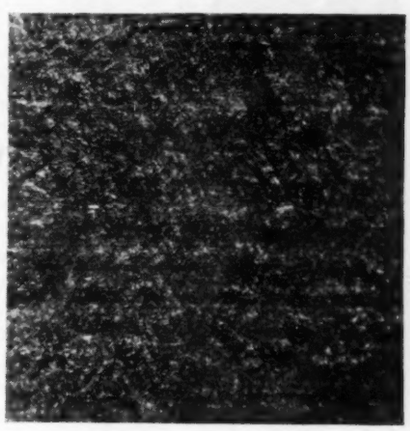


FIG. 16—STEEL SHOWN IN FIG. 7 AFTER HAVING BEEN PICKLED 40 MINUTES

Gray Iron Foundries Face Dawn of Promising New Era

By E. A. Custer, Jr.

GRAY iron castings were produced as early as 1300 but the beginning of the industry really dates from the invention of the first cupola in France in 1722. From that year the gray iron foundries progressed with extreme rapidity. By the time of the Revolutionary war it was recognized as the leader in all the fields of metallic industry and it held that position with increasing strength up to the time of the Civil war.

Then steel began to win favor and almost immediately the supremacy of the gray iron foundry received its first body blow. Steel producers worked feverishly. They were responsible for the first chemical laboratories, early testing machines, etc. They improved the product, learned to alloy it and to produce it in form for almost every building, industrial and mechanical requirement. Then they learned to quench, and to form, stamp and shape it by mechanical means.

But in the meantime cast iron was still cast iron. Gradually its prestige suffered, partly because engineers lightly slurred it in praising other materials and partly because throughout the country gray iron foundrymen fell into a state of apathy.

But today we are face to face with a new era, in which we may develop gray iron foundries to a point where they will be second to no metallic industry in this country. This position may be obtained if gray iron foundrymen will show the same progressive spirit as has been manifested by the producers of steel and other successful competitive materials.

Consider the foundry of tomorrow, first from the standpoint of quality, second of economy and third of quantity or rate of production.

Economy and Rigidity

Today engineers concede cast iron has two virtues that make it valuable. One is its economy or cheapness in price and the other is its physical quality of rigidity. Would it appeal to engineers as an ideal metal if to the quality of rigidity could be added some of the qualities now presented by steel and other metals? Are we correct in assuming, as practically every foundryman did a few years ago, that cast iron is cast iron, always has been and always will be? Why should we not expect that under proper scientific development gray iron may be developed for new uses just as steel and other products have been developed?

In 1910 the writer was instrumental in producing an ordinary gray iron that could be tempered. Tool bars were made of ordinary commercial gray iron, then annealed, machined and re-hardened until the hardness reading showed that they were harder than any steel on the market at that time. These tools were used for cutting cold rolled steel and for cutting bands on shells. They gave excellent results except that they were brittle and would snap under shock. Commercially they were of little value but they demonstrated the possibility of obtaining in lowly cast iron one important quality possessed by steel—that of tempering.

A year later the writer found that when treated this same cast iron would take and retain magnetism the same as steel and hold it longer.

In 1923 a new process was developed whereby some of the qualifications of malleable iron may be produced in gray iron through heat treatment. The writer was connected with the company where we produced cast iron bars that could be bent cold as far as 30 degrees and when heated the bars could be tied into knots. Once again we find that when properly handled, cast iron possesses some of the attributes that belong to steel.

A company was formed to promote this heat treating process but it was abandoned almost immediately because it was discovered that the Germans, starting with so-called pearlitic iron, were duplicating our results using metal straight from the cupola without any heat treatment.

In extending their experiments the Germans have been making a study of the eutectic properties of carbon in cast iron and they state that it is possible to produce various grades of carbon in ordinary cast iron up to and including the type of carbon that appears in malleables. They declare it is feasible to produce a cast iron having all of the properties of malleable iron except that the elongation is from 2 to 3 per cent instead of the customary 10 per cent. In addition it has the element of rigidity.

One cannot imagine a more ideal iron than one in which strength and ability to withstand torsion, fatigue, strain and stresses is equivalent to malleable and in some cases to steel, also has the rigidity of cast iron and yet may be made as economically as gray iron. Were we to produce such metal in this country would we not be able to attract a great deal of business that has been lost by gray iron foundries?

Temperature Control Important

The foundrymen of tomorrow will pay more attention to temperatures. How many now know the exact temperature of the molten iron coming out of the cupola? How many know what they could do if they altered that temperature?

The Baldwin Locomotive Works, Philadelphia, installed pyrometers on the cupolas, gave more attention to melting operations, balanced the ratio between fuel and oxygen, ascertained that a maximum of CO_2 gas was being obtained in the high combustion chamber and a minimum of CO gas in the lower combustion chamber, in-

Help Fan the Flame!

A LONG smoldering fire of discontent over business conditions in the gray iron foundry industry is gradually being fanned into a flame of activity that sooner or later will bring about important changes in technical procedure and an awakening to the necessity of better marketing.

The accompanying article, abstracted and adapted from the extemporaneous remarks of the author before the convention of the National Founders' association in New York last week, undoubtedly will give further impetus to the movement.

Mr. Custer paints an alluring picture of the foundry of the future. His hopeful view of latent possibilities is recommended for the attention of every foundryman who is interested in upbuilding the gray iron industry.

—THE EDITORS.

creased the temperature of iron by from 100 to 200 degrees as it came out of the cupolas and thereby reduced the daily casting loss one-half.

Powdered coal, used by producers of steel and malleable iron, now is being tried in cupolas. One advantage is that a neutral flame is maintained which neither carbonizes nor oxidizes at the maximum temperature of 3500 degrees. The foundryman can always be sure that he is not injuring the quality of the metal or the character of the melt. Also it is estimated whereas today a 6 to 1 ratio in the metal is obtained, by using powdered coal a ratio of from 16 to 20 to 1 may be expected which would cut the fuel cost by more than a half.

Now for the question of economy. Probably the greatest cause for losses in the foundry lies in sand troubles and sand conditions. Every foundryman knows and every sand dealer knows that nature does not provide sand that runs uniform day in and day out. They try to overcome this by blending three or four sands together so that variations in one will be partially overcome by the others. Since 1917 much progress has been made in the preparation and uses of synthetic molding sand. Today it is being employed with great benefit by a number of the more enterprising foundries. There is no reason why every foundry in the United States cannot do what the progressive ones have done. It does not involve a tremendous expense and the savings are obvious.

One cannot view the foundry of the future without thinking of permanent molds, better termed long-life molds. They will never be a cure-all for foundry trouble and there are many types of castings unsuited to casting in long-life molds. On the other hand the number of castings adapted to the process is large.

Saves in Direct Labor

Long-life molds have been made for castings ranging in size from tackhammers for the Woolworth stores to carwheels for the Pennsylvania railroad. When foundrymen first consider long-life molds, they must make up their minds that no mold will go off smooth and easy on its first try. Every mold requires study, care, patience and considerable expense until the actual time of operation is determined and the design perfected so that the castings will fall out freely and quickly. Once this has been achieved, the foundryman is in a position to reap a reward of savings in direct labor, which in the writer's experience is the difference between $2.47 to produce castings in sand and $0.87 to make them in long-life molds.

Facing for sand molds is used to provide a clean, bright appearing casting and to prevent the sand from burning or adhering to the casting. How much money could be saved in every foundry if a method of cleaning were available which would leave the castings cleaner, brighter and smoother than is permitted by present practice? If the use of facings were cut to the minimum, how much could be saved in cleaning?

Some years ago the hydraulic method of blowing out cores was tried and found successful, yet it was not satisfactory for cleaning castings because it did not remove burned-in sand. This year the hydraulic method of cleaning was again tried, but this time sand was introduced into the water. The tests were surprisingly successful and a machine now is being developed on this principle.

A gray iron casting subjected to a sand and water stream for 10 seconds looked as though it had been nickel-plated. A section of steel gate with sand burnt in was put under the stream for 15 seconds and emerged as bright and clean as if it had been filed.

And now for a recapitulation. If our foundries turn out a product that is precise and exact and bound to win approval among users, employ the right grade of sand and the proper molding procedure to cut down losses, use efficient equipment for handling molds and conditioning sand to insure economy in these operations, and adopt a method of cleaning which produces a casting of almost unbelievable appearance—if they can do these things, what more can be desired?

Isn't This "If" Worth Working For?

IF GRAY iron foundrymen will show the same spirit of aggressiveness and will co-operate with the same determination displayed by individuals in more successful industries, it cannot be long before every castings shop in the United States will be back where it rightfully belongs—predominant in the field of metallurgy and secure on a basis of equitable profits."

—E. A. CUSTER, JR.

The United States exported one mining locomotive each to Mexico and Chile in August.

Announces Conference on Welding Practice

Purdue University, Lafayette, Ind., announces the third annual welding conference to be conducted Dec. 13-15 under the joint direction of the engineering department and the department of practical mechanics, with the school of chemical engineering and manufacturers of welding equipment co-operating. Manufacturers and others interested in the application of welding are invited to attend the conference which will deal with electric, thermit and oxyacetylene welding as applied to manufacturing operations. The conference in 1926 had an attendance of 228. The program will consist of numerous papers, discussions and demonstrations. A number of manufacturers will display welding equipment.

Belgium Tries Steel Ties

The National Railways Society of Belgium has decided to try steel instead of wooden ties and will place an order for 60,000 steel ties with the Belgian industry, reports the American commercial attache at Brussels to the department of commerce, Washington. The ties will be first tried out on the line between Liege and Marloie. If these tests give satisfactory results, the society is said contemplating replacement of the old wooden ties.

Features of Pickling

(*Concluded from Page* 1293)

Fig. 14 shows the surface after being in the pickle 15 minutes.

Fig. 15 shows the surface after being in the pickle 25 minutes. The surface is beginning to show a rugged condition due to the action of the acid.

Fig. 16 shows the surface after being in the pickle 40 minutes. It is now extremely rough and rugged.

One-pass cold-rolled, 28-gage steel usually is pickled in practice for about 45 minutes in a 1½ to 3 per cent sulphuric acid pickle at 130 to 150 degrees Fahr. The kind of scale, and the thickness of the scale must be taken into consideration in pickling. The Fe_2O_3 series will dissolve fairly easily and, therefore, is not hard to remove; the Fe_3O_4 series dissolves but little and is difficult to remove.

A summary of the facts regarding iron oxides and scales follows:

1. Commercial iron oxides and scales on iron and steel products may be classified roughly into two series.

2. The kind of iron oxide or scale produced depends on the state of equilibrium of the following components which produce them—iron, oxygen, water, temperature, pressure, time, atmosphere, mechanical action, and influence of various other components.

3. Temperature is indicated by the color of the iron oxide, shades of yellow and brown indicating low temperature and shades of red and blue indicating high temperatures. (Fe_2O_3 series.)

4. Roughing and finishing mills produce Fe_3O_4 scale, magnetic oxide of iron.

5. Magnetic oxide of iron is produced under conditions of falling temperature, pressure, retarding chemical action with decreasing oxygen, and water. Ferric oxide of iron is produced with increasing temperature, increasing chemical activity, increasing oxygen combination, and decreasing water.

6. The physical condition of the oxide or scale is influenced by the pressure and water component. Without pressure and with small amounts of water the oxides have a tendency to be dry and grainy; with pressure, and with plenty of water, the oxide tends to be compact and plate-like.

7. The kind of scale produced depends entirely on the conditions of equilibrium present, and the amounts of scale depend on the quantities of the components available and the time through which any given set of conditions operate.

High Blood Pressure Causes Accidents

CAREFUL research in the field of accident prevention and physical fitness has developed the fact that the proportion of accidents is much higher with operators having high blood pressure, according to C. S. Slocum, safety adviser, Boston Elevated railroad, Boston. In a large proportion of cases the cause of an accident may be traced to irritation or confusion on the part of the operator either of an elevated train or a machine tool, according to Mr. Slocum. The remedy for this is to be found in the physical examination of applicants, the periodical examination of employes, and in the work of mental adjustment of the employe to his job.

This was one of the problems discussed last week before the third annual fall meeting of the Personnel Research Federation held last week at Hotel Pennsylvania, New York. Nearly 300 attended the sessions at which the keynote was the value of research work in the various fields of personnel work. In addition to many technical papers, the program included round table discussions and one evening meeting in co-operation with the metropolitan section of the Taylor society.

The group plan of discussion was used by the federation for the first time, the principal groups being measurement of leadership, technique of interview, accident reduction, and measurement of mechanical abilities. Committees were appointed under these headings to guide further research. The federation brings together for mutual discussion of personnel problems, a large group of business, governmental and educational institutions. The speakers at the evening joint sessions included H. S. Person, managing director, Taylor society, Joseph W. Roe, professor of industrial engineering, New York university, Walter V. Bingham, director of the Personnel Research Federation, and Joseph O'Connor, General Electric Co., Schenectady, N. Y.

The problem of measuring technical ability was discussed by several of the speakers and by the round table groups. M. S. Viteles, University of Pennsylvania, Philadelphia, in a paper on the subject told of the difficulties of determining specialized abilities by examination or test. He said that a variety of techniques and a great multiplicity of instruments have been developed.

B. V. Anderson, R. H. Macy & Co., New York, stressed the importance of the interview in selecting employes of specialized ability. He said that the interviewer must be well acquainted with just the thing the applicant will be expected to do. In the discussion of this general subject the use of a vocabulary test in determining specialized knowledge was advocated.

Simple Tests Prove Effective

C. J. Howe, General Electric Co., Schenectady, N. Y., in a paper on measurement of mechanical abilities told in considerable detail the methods used by his company in selecting workers for particular fields. For instance, men who are to be employed as visual inspectors are shown a drawer full of small objects and after a short time are asked to describe the nature of the exhibit. A test which the General Electric Co. has found to be very useful in determining capacity for various kinds of work consists of assembling a large block of wood which has been cut into irregular pieces much after the nature of the familiar oriental puzzles. Those applicants who stand high in this particular test almost invariably will make good machinists.

The work possibilities of an applicant are evaluated in two ways, according to Dr. Anderson, one is by diagnosis and the other is by adjustment. The second is even more important in employment work than the field in Dr. Anderson's opinion. After you have hired a man you must know whether your choice was correct and a follow up system is of the utmost importance in this connection.

In general, employment work falls under three headings: 1. Ruling out undesirable applicants; 2. employing workers for most fitting jobs; 3. conducting an extensive follow-up system.

In modern employment work all mystery and occultism has been eliminated. Behaviorists and psychologists have contributed much, and the profession is rapidly getting on a scientific basis. However, the finest system of selection falls down through lack of material to select from. When there are not enough good applicants, fair applicants must be hired and in this case it is of utmost importance to follow up each applicant and attempt to adjust him to his work. The largest percentage of turnover in any manufacturing plant comes during the first three or four weeks after hiring. This is the time for close scrutiny and adjustment. Workers not suited to one department frequently may be switched with success to another. In general, Dr. Anderson feels that too much emphasis is placed on selection and not enough on follow up.

The question of proper illumination is one closely associated with personnel problems. Industrial accidents have been found to increase in winter and to be heaviest during times when daylight is poor. Walter N. Polakov, consulting engineer, New York, in a paper on influence of illumination told of a recent investigation in which it was found that 24 per cent of the accidents investigated could be traced to poor light. The work of several illuminating engineers has determined an intensity of from 8 to 10 foot-candles as best suited to general working conditions. Under such a light intensity accidents and mistakes invariably are reduced.

ACCOUNTING FOR LABOR IN METALWORKING PLANTS

How Payment of Wages, Knowledge of Labor Costs and Overhead Expense and Control of Labor Are Simplified Through Use of Efficient Accounting System

Part II—Summarizing Labor Costs and Preparing Payrolls

By J. J. Berliner

THE second principal step in accounting for labor consists of checking the labor cards. The time cards for each day are checked the following morning and it is the duty of the time clerk to see that the cards for all worker's in each department are checked. To do this properly, he must be provided with a list of the numbers of the workers in each department and must prepare overtime reports, Fig. 5, and late and absent reports, Fig. 6. For exceptions to the regular hours of employment the procedure is as follows:

Shortly after the starting time in the morning and after the lunch-hour, the time clerk takes the cards left in the "out" rack and keeps them in his time booth. Any worker who is late reports to the time booth for his time card and the time clerk fills out on the late and absent report the worker's number and name, and the rest of the data called for on the report, which is self-explanatory. Absent time is recorded in the same general way from the cards of absent workers and during the day for all worker's who leave the plant before the regular time for quitting.

The author is senior member, National Accounting Systems, New York.

From the passes issued for overtime, the time clerk prepares the overtime reports, which are self-explanatory.

For all workers who are present for the full day's work, the time on the time cards must total the regular hours—8, 9, or 10, as the case may be. After the time cards are checked by the time clerk for full labor hours as well as for full machine hours, they are placed in numerical sequence and are then forwarded to the payroll office.

Accounting for the Labor

The third principal step in accounting for labor is the summarization of labor costs. Before the payroll sheet is taken up, it might be well to insert a word about the condition of the time cards when they reach the payroll department. By turning over these cards in orderly and proper shape, the time clerk can assist the payroll department materially.

It is very important, for instance, that the time cards be delivered to the payroll department will all cards representing the day's work of each man. The cards for each man should also be in their numerical sequence, it being remembered that when a man uses more than one card per day the various cards representing his day's work are serially numbered.

It is natural that the cards should be in order, as the last move made by the dispatch clerk or time clerk should be to verify the fact that a man's entire time is represented by the time cards, after they have been checked with the late and absent reports and the overtime reports. The cards should also be in sequence according to the worker's check number, as this is the condition in which they should be handled in the time booth of the plant.

The payroll sheets, Fig. 7, should be in binders and should be made ready for the entries of a pay period before the entry of the payroll is started. This means that the full data at the top of each payroll sheet should be filled in, including the department name, the name of the worker, his day rate, his check number, and the payroll period.

If the sheets are prepared ahead of time from the list of check numbers last known to be employed in the department, a great deal of time will be saved in the current work of entry. In some places it has been found advantageous to have the payroll sheets loose during the posting period, as the sheets will then be

OVERTIME REPORT

DEPARTMENT _____ DATE _____

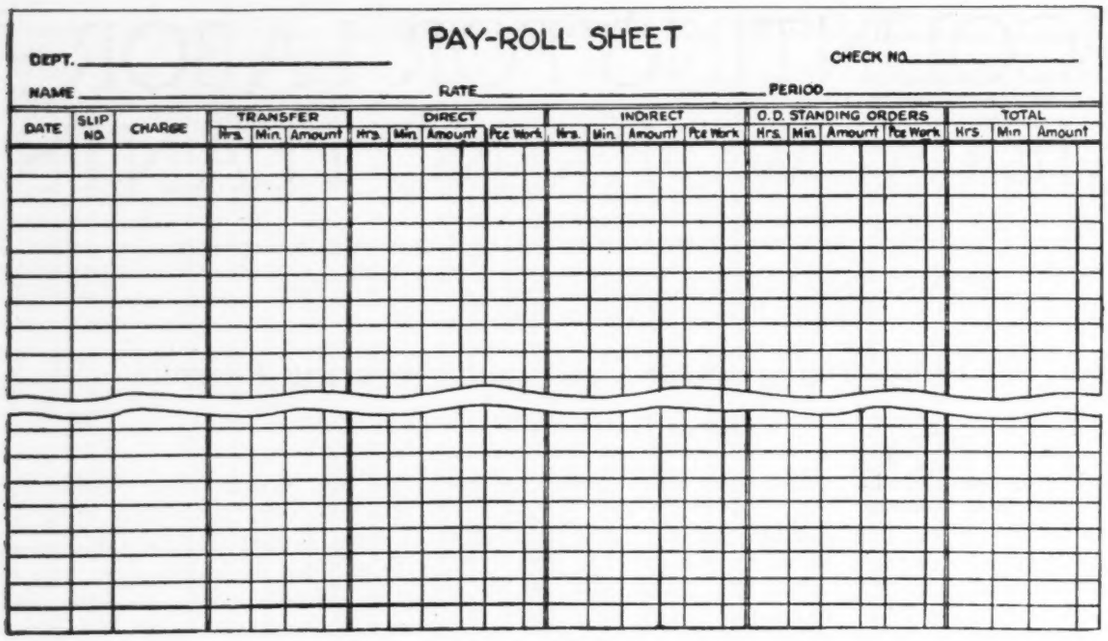
WORKERS' NO.	NAME	TIME IN	TIME OUT	TOTAL OVERTIME
		SIGNED		

LATE AND ABSENT REPORT

DEPARTMENT _____ DATE _____

WORKERS' NO.	NAME	MORNING		AFTERNOON		TOTAL TIME ABSENT
		IN	OUT	IN	OUT	
	SIGNED					

Fig. 5—Overtime report card. Fig. 6—Late and absent report. Both forms are 5 x 7¾ inches


PAY-ROLL SHEET

DEPT. _____ CHECK NO. _____

NAME _____ RATE _____ PERIOD _____

DATE	SLIP NO.	CHARGE	TRANSFER			DIRECT				INDIRECT				O.D. STANDING ORDERS				TOTAL		
			Hrs.	Min.	Amount	Hrs.	Min.	Amount	Pce Work	Hrs.	Min.	Amount	Pce Work	Hrs.	Min.	Amount	Pce Work	Hrs	Min	Amount

Fig. 7—Form for payroll sheet. Size 13 x 18½ inches

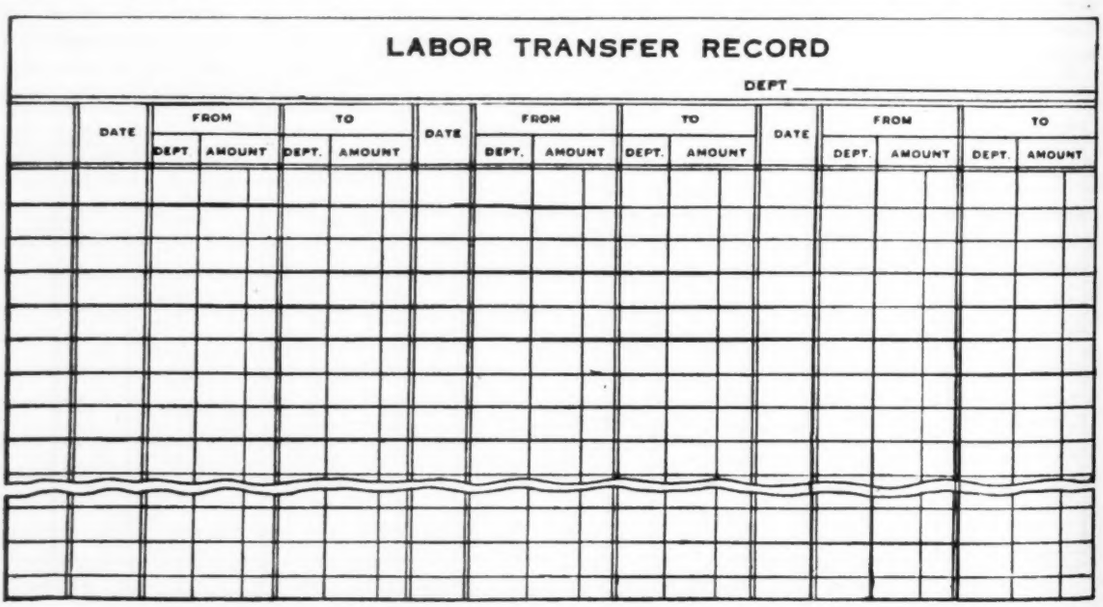
perfectly flat for entry. If this method is used, however, great care must be taken to see that none of the sheets become separated from the file.

The first column on the pay-roll sheet, Fig. 7, is the date column, in which it is necessary to enter the day of the month, as the period date at the top gives the other information desired. The column headed "Slip Number" is for the purpose of entering the serial number of the slips for the worker when more than one time card is required to represent his work. In this connection, it is to be remembered that the serial number on the last card representing the day's work should be enclosed in a circle. This automatically shows the pay-roll clerk that all the cards for each worker are in hand. The column headed "Charge" is for the entry of the order number covering the work accounted for by the time card. This may be either a standing order number or production order number. The nature of this order number regulates the entry of the time in the columns which follow:

There are five main blocks of columns across the sheet. The first four of these are of extreme importance, as they become the basis of the controls for each subsequent movement of labor through the medium of journal entries. Each has a very specific use, and too strict attention cannot be paid to mastering and understanding fully the uses to which they are put. The blocks are herewith described in regular order:

1. Transfer. When one department loans a man for some hours or days to another department, the time of loaning is usually not sufficient to warrant changing his check number, and therefore this method is used to obviate the mix-ups which might otherwise arise. When the payroll clerk of the department recording the pay of a man who has been loaned to another department finds a card stamped "Transferred to Department A," he should enter this card under the transfer heading. This entry has the effect of registering the man's time for pay on his own payroll, and at the same time providing the entry in a column ready for use in connection with the labor transfer record.

2. Direct. A card whereon the order number shown is that of a productive order of the home department, should be entered in this block. It will be noted that there are two main columns shown in this block, as well as the two succeeding blocks, one headed "Amount" and the other headed "Piecework." The object of this distinction is to separate day and piecework in order that the pay-rolls may automatically show how


LABOR TRANSFER RECORD

DEPT _____

	DATE	FROM		TO		DATE	FROM		TO		DATE	FROM		TO	
		DEPT	AMOUNT	DEPT.	AMOUNT		DEPT.	AMOUNT	DEPT.	AMOUNT		DEPT.	AMOUNT	DEPT.	AMOUNT

Fig. 8—Labor transfer record Size 8½ x 11 inches

much of the direct labor is operating under daywork as against any special inducement method other than daywork. It might be noted here that the straight-time earnings under bonus work or any other kind of premium work should be also entered in the piecework column, this heading being used for any kind of work other than straight daywork.

3. Indirect. The indirect block is arranged exactly as the direct block. Entries to be made therein are confined to work performed by anyone in the department on any standing order number of the department. In other words, no work must be included which is done by the department on the standing order number of any other department or any general department. The entries must be confined wholly to work on the standing orders of the department of which the worker whose payroll sheet is being prepared is a member.

4. O. D. Standing Orders. "O. D. Standing Orders" is designed to cover the entry of any work performed by the department of which this employe is a member, on the standing order of any other department in the plant. The work entered in the O. D. S. O. columns is of the same nature as that entered in the direct column, so far as the originating department is concerned, and must be considered in conjunction with the direct in finding the basic figure for the burden rate.

5. Total. The entries in the "Total" column consists simply of the total time and amounts, and show the total earnings for each day, as well as the total time for each day. In this connection, it might be brought out that even though the time cards are supposed to have been verified by the time clerk as to the total elapsed time for each day, the clock cards are brought to the payroll department at the close of the week for a final check against the time as shown daily on each man's payroll sheet, to doubly safeguard the accuracy of the payrecords.

Closing the Payrolls

As each day of each man's time has been entered, the total time and amount has been brought out to the total column. At the close of the pay period the entire sheet is footed vertically in all its columns, and cross-footed to agree with the vertical footing of the total column. This makes an absolute check on the accuracy of the time and money entries and is a valuable feature in connection with the technique of pay-roll accounting.

If bonus or premium systems are in effect, it is then in order to enter at the bottom of the payroll sheet the bonus or premium which is due each man, in case there is no special bonus or premium payroll sheet provided therefor. Deductions from the payroll which may be necessary, should then be entered. After these additions and deductions have been made, the net amount of pay for the man can be computed, and the pay envelope made out accordingly.

Splitting of Payrolls

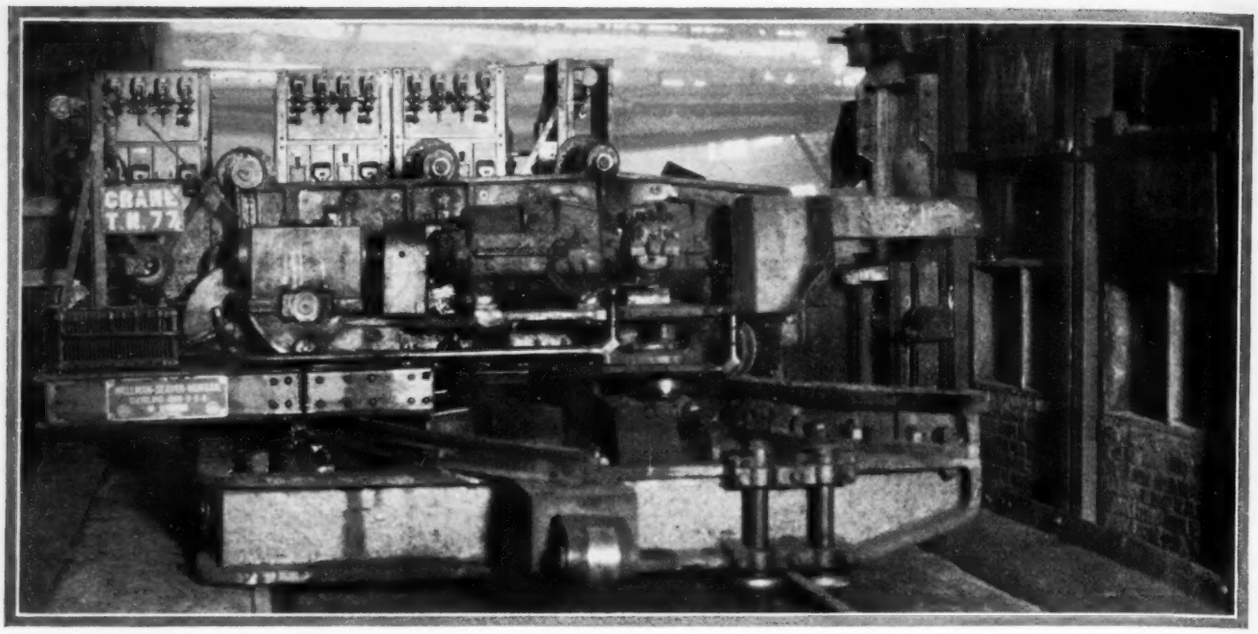
Many times when the payroll period is one week, the end of the month comes in the middle of a week. In such cases, it is necessary to enter the cards of the last working day of the month and to rule footing lines after the entries of this day. The entries for the remaining days of the week are then made, and after all the entries are in for the last day of the week, another subfooting line is ruled in. It is then necessary first to add the sheets down to the first subfooting, and then the balance of the days of the week down to the second subfooting, each action separately. The two subfootings must then be added to arrive at the total for the week.

The next operation is to arrive at the total of the payroll for each department. The procedure consists merely of adding the total time and amount of money for each block, whereby is shown the total for transfer, direct labor, indirect labor, O. D.

(*Concluded on Page* 1302)

Outline of Various Methods of Wage Payment

	Procedure	Comment
Average the Output and Approximate the Pay to It	**Straight Sales or Hourly Wage**	
	Classify workers kept time. Supervise quality and quantity. Adjust wages to worth.	Traditional method. Value depends on judgment and frequent revision.
	Standardized Day Work	
	Set standard operation. Costs or machine set pace. Grade wage rate (Monthly by workmen's records).	Where work is routine, has proved effective and less cumbersome than bonus or piecework.
	Additional Bonus or Commission	
	Examine workers records at intervals and add a lump sum to current pay.	Especially useful among better educated classes of employes.
	Share the Profits	
	In proportion to each man's wages, according to individual record, in an arbitrary amount for each grade of workman. Payment in cash, stock or both.	Required a long period for test of its effect on efficiency, but successfully applied to many types of business.
	Gantt Plan	
	Standardize time and teach best method. Set a task, pay hourly wage as a minimum. Add 25-100 per cent bonus for standard time and quality.	Suits varied tasks. A simple intermediate between day work and scientific piecework.
Fit the Pay Accurately to the Output	**Straight Piece Rate**	
	Standardize conditions and set rates accurately. Guarantee day rate as a minimum. Correct and inspect output. Avoid rate changes.	In theory, perhaps the fairest way to pay. Adapted to "Report", operations. Simple to operate.
	Premium Plans (Rowan L. Halsche)	
	Correct conditions and establish standard pay day wage. Pay workers extra for time saved.	Easy intermediate. Step from day work to piecework.
	Taylor Differential Piece Rate	
	Standardize tools and motions. Teach workers. Set a minimum piece rate that will net regular day wage. Pay a rate up to 40 per cent higher per perfect piece where output is up to schedule.	Sharply stimulative. Especially fit where labor cost is low and machine or overhead cost is high. Complicates payroll and cost calculations.
	Emerson Premium Plan	
	Standardize and teach work as in Taylor System. Set minimum hourly rate of pay. Layout grades of efficiency. Add a per cent to rate of men who grade 66⅔ per cent increase up to 20 per cent bonus at 100 per cent and more above.	Theory nicely planned to encourage work. In practice, often not understood or appreciated by workers. Complicates payroll and cost calculation.



Machine for turning ingots in the heating furnace serving a pilger type seamless tube mill

Turning Machine Designed for Tube Mills

THE recent impetus given in this country to the manufacture of seamless steel tubes of the larger sizes has necessitated the production of special machines to meet the peculiar and severe operating conditions, as well as to lighten the burden of hand labor. In the manufacture of seamless tubes on pilger mills tapered round ingots of a diameter approximately 50 per cent larger than the finished product generally are used.

The round tapered ingots are heated preliminary to the piercing process, in a continuous heating furnace having a long inclined hearth. The taper on these ingots prevents their rolling down the inclined hearth in a line parallel to the walls, the path being rather in the arc of a large circle.

To overcome this difficulty it has been customary to provide the side walls of the furnace with a series of doors or poke holes spaced on 3 or 4 feet centers through which bars were inserted and the ingots straightened on the hearth and rolled down toward the discharge end. This was done by hand labor. The extreme heat as well as the size of ingots required for large tubes made it difficult to maintain a suitable force of men; the operation was slow and in general was considered unsatisfactory.

To eliminate these conditions, therefore, the Wellman-Seaver-Morgan Co., Cleveland, recently has developed and put into successful operation two fully mechanically-operated barring or ingot turning machines. They are extremely rugged and of all cast-steel construction.

The new machines traveling on an inclined track parallel with the furnaces, and having the same slope as the furnace hearth, perform all the functions previously done by hand with greater speed and ease, and in addition eliminate from six to eight men from the force required to operate each furnace.

Two Carriages Employed

Each consists of two distinct carriages. The lower unit is a massive one-piece steel casting mounted on four wheels, engaging the main inclined track. These wheels are driven in pairs by two motors. On the upper surface of the lower carriage is carried a section of a circular track, the center or radius point being located at the center of the furnace wall. The upper carriage travels on this curved track and carries a long wedge-shaped bar which can be moved in and out of the furnace, swing about the radius point, rocked vertically and also turned about a horizontal axis. Each motion is operated by an independent motor and all are under direct control of the operator who is located at the rear and to one side of the center of the upper carriage of the machine.

The location of the pivot point of the bar when swinging in a horizontal plane is such that the extreme angularity may be obtained regardless of its position in relation to the furnace. To facilitate the changing of bars, a quickly detachable connection is provided between the bar and its supporting spindle. Electric current is brought to the machine by means of an underground conduit, maintaining a clear space overhead.

Three of the larger ingots may be straightened on the hearth or rolled down its inclined surface at one time by each machine. In case ingots become partially welded together they may be sliced or separated by the bar, due to its shape. The majority of the drives are of the worm type. The worm reductions as well as all spur gear reductions operate in oil baths contained in cast-steel housings. Due to governing clearances, these machines are compact, yet all parts readily are accessible for inspection or repair. The salient features of construction are protected by pending patents.

Mills of Backed-Up Type Remove Cold Rolling Limitations

Small Arc of Contact with Metal Being Reduced Decreases Spring and Obviates the Necessity of Roll Crowning

By Lloyd Jones

APPLICATION of mills with backed-up rolls is not new, and has been practiced throughout the metal rolling industry continuously in various forms and shapes for over 60 years. There are approximately five types of backed-up mills.

1.—The 3-roll type, of which the Lauth plate mill is the leading example, is in general use throughout America. In this mill the two large rolls alternately become supporting rolls to the middle roll as the plate or sheet is run between the middle and the top roll, or between the middle and the bottom roll. Another common use for the 3-roll backed-up mill has been in the hot and cold strip industry, where is has been common for many years.

2.—The 4-roll backed-up mill, where each working roll has one supporting roll.

3.—The 6-roll mill, commonly called the cluster mill, where each working roll has two supporting rolls.

4.—The 7-roll, or what might be termed the 3-high cluster mill, wherein there are three working rolls, the top and bottom of these rolls being each supported by two backing up rolls.

5.—There is another type of 4-roll backed-up mill, of which there have been few built. This is a modification of the 3-roll mill. In this case, on account of the small diameter of the work roll, it was supported on the bottom by two backing up rolls, the metal passing between the small roll and the large top roll. In this particular type of mill, rolls as small as 2 inches diameter were used successfully in reducing metal.

Of these various types, the 3-high is in most general use, with the 4-roll and the cluster types following in order as named. For the rolling of sheets and strips, the 4-roll type and the cluster type are better adapted than the 3-roll type, and eventually will supersede it altogether. The relative merits of the two outstanding types of backed-up mills, namely the 4-roll and cluster types, follow:

4-Roll Type

1.—Shorter distance from the edge of the housing to the center of the mill.

2.—Less number of rolls.

Cluster Mill

1.—No bearings for holding the working rolls in alignment are necessary.

2.—The working rolls cannot wear out of alignment, hence the operator does not experience the difficulty which the 4-roll operator experiences, due to the terrific end thrust of the working rolls when they become slightly crossed.

3.—The working rolls can be changed more quickly, as there are no bearings to handle.

4.—The working rolls automatically align themselves when placed in the mill by coming in contact with the two supporting rolls, eliminating the human element in lining up the mill.

5.—The contact pressure between the work rolls and the supporting rolls is approximately 30 per cent less per inch of face on the cluster mill, as compared to the 4-roll mill.

6.—The working roll is supported in both directions of force, and hence, smaller diameter rolls can be used to accomplish the same work.

7.—With equal diameter of working roll, and with the ratio of backing up roll to the working roll approximately 2 to 1, which is the general ratio, the cluster mill has approximately 40 per cent greater capacity.

Shifting Is Eliminated

Holding the rolls in alignment on the 4-roll type has been a problem. The brasses on the necks become worn, or the mill is not set in correct alignment, and the rolls quickly develop an end thrust which makes the changing of the roll neck brasses necessary at frequent intervals. To overcome this tendency, the last mill shipped to the American Sheet & Tin Plate Co. was equipped with roller bearings on the working rolls as well as on the supporting rolls. This was accomplished because the mill was to be used for cold rolling purposes, and the working rolls were made of hardened tool steel, which allowed the neck diameter to be reduced sufficiently to install the bearings, and at the same time to have sufficient strength to prevent the neck from twisting off.

It is a question whether this can be done successfully when the mill is used for hot rolling purposes, especially with rolls made of chilled iron. In this case a metal of low strength has to be considered and the torsional stresses probably would twist off the neck.

Another illustration having to deal with supporting the rolls in both directions, is that on the 4-roll mill if a cobble takes place, the working rolls are apt to break and fly out of the mill. On the cluster type of mill, an accident occurred where the metal being rolled escaped the stripper, and passed around the working roll between the supporting rolls approximately six times before the mill was stopped. The only damage that occurred was that the working roll was marked and had to be taken out and redressed. No damage was done to the supporting rolls or to the roller bearings, and the six thicknesses of metal were reduced to the single thickness being rolled, the six laminations being actually welded together cold. This was a remarkable example of the enormous pressure which roller bearings will stand.

Roller bearings have been applied for the last three years on 4-high, cluster type, and also on the ordinary 2-high mills. In regard to the application of roller bearings to mills, this like the backed-up roll principle, is old as to the writer's knowledge. Roller bearings on both 2-high mills and backed-up mills have been in actual use for probably 16 years in this country.

The construction of the 4-roll and cluster types of mills render themselves ideally to the application of roller bearings. This is one of the reasons why mills of these types rapidly are coming into favor. The power saved by the use of the small diameter rolls is not as great as the power saved by the use of roller bearings. The roller bearing application, however, is spreading to 2-high mills in this country such as are employed for the rolling of steel sheets and black plate.

No difference is involved in the principles of the adjustment of rolls in

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From a paper presented before the iron and steel division of the American Society of Mechanical Engineers, Youngstown, O., Nov. 10. The author, Lloyd Jones, is manager, Salem, O. division, E. W. Bliss Co., Brooklyn, N. Y

the backed-up mills. The only departure has been the application of electric power to the screwdowns in place of hand power. This, of course, is not new on plate mills, blooming mills, etc., but is new to the sheet and strip industry. In regard to adjustment of the rolls as far as alignment is concerned, practice is to so build the mill that the workman has nothing whatever to do with it.

In the cluster mill the working rolls align themselves. In the 4-roll mill for cold rolling, roller bearings on the working rolls take away all adjustment features. For hot rolling, where there is difficulty in applying roller bearings to the working rolls, the best solution to this problem will be the adoption of the cluster type of mill in place of the 4-roll mill. This will also solve several other difficulties present in the 4-roll mill which has up-to-date been generally used for hot rolling, namely the alignment of the working rolls, increasing the life of the supporting roll surface by from 30 to 50 per cent, and decreasing roller bearing troubles now experienced, and for reducing work roll breakage.

Another interesting feature about backed-up mills is that on account of the small arc of contact with the metal being rolled, the total bending load on the mill is considerably less. This cuts down the deflection or spring in the mill, and in many cases obviates the necessity for crowning the rolls. The practice of shaping the surface of the roll to deliver a sheet or strip within commercial tolerances has been common practice.

When the first cluster mill was installed at Huntington, W. Va., in the early part of 1923, the assumption was that it would be necessary to crown the working rolls and the mill was started with one roll straight and the other crowned. The backing-up rolls were all straight cylinders. Little crowning was found necessary and this gradually has been reduced.

This question of shaping the rolls is becoming of less importance every day, practice now is to ship the mills with rolls ground perfectly straight. Whether crowning of the rolls is necessary or not seems to depend upon the product which is rolled in the mill. With the use of roller bearings, which eliminates the heat produced by neck friction, the swelling of the rolls at their ends due to increased temperature is being eliminated, and this in turn has a tendency to do away with the old practice of shaping the rolls before they are installed.

In about 1913 eight cluster mills and one 4-roll mill were in operation. About 1916 the second 4-high mill was installed at Lukens Steel Co. From then a gap of approximately seven years exists. From 1923, a tremendous building of backed-up mills took place. During 1922, the International Nickel Co., Huntington, W. Va., was making full-finished nickel and monel metal sheets. In order to secure the desired surface, it was necessary to grind, polish, and buff the sheet before sending it out to the trade. This was a slow and costly process.

Reducing the thickness by cold working secured a surface which would eliminate the grinding process. The experiments were conducted on the ordinary 2-high mill with strip approximately 18 inches wide. To accomplish the same amount of reduction on 36-inch wide strip on the ordinary 2-high cold sheet mill with rolls 26 inches diameter, it was found necessary to make from 40 to 60 passes. A mill of the backed-up principle then was proposed. In studying over the advantages of the two types of mills at that time, the preference fell to the cluster type. This mill accomplished in three to four passes what took 40 or more passes on the regular 26-inch mill.

This was really the starting of the modern strip method of rolling sheets, because it removed the limitations on the old cold rolling strip practice, and allowed this practice to be adopted to widths wider than had been rolled.

O.D.S.O. TRANSFER RECORD

Dept._____

Date	From			To			Date	From			To		
	Dept	Labor	Burden	Dept	Labor	Burden		Dept	Labor	Burden	Dept	Labor	Burden

Fig. 9—O. D. S. O. transfer record. Size 8½ x 11 inches

Accounting for Labor

(*Continued from Page* 1299)

standing orders, as well as the total payroll. Note that the totals are to be in both time and money.

This total must be arrived at for each individual pay period, but in addition to this a monthly total will be made up by recapitulation as follows: The last subtotal of a split payroll at the beginning of the month starts the recapitulation for the month. The full payrolls during the course of the month are then taken, and to them is added the first part of the split payroll at the end of the month. This gives the exact total of the payroll during the current month, which then becomes the basis of the journal entries to effect the controls.

In this connection it should be stated that the total of the full week's payroll is the amount for which the payroll check is drawn and which credits cash and charges the payroll account. It will be seen by this that the credits which are made to the payroll accounts because of transfers to the various control accounts are in advance of the payment of the last payroll, which in turn explains the reason for there being always in the balance sheet an accrued payroll in the liability section. Only the actual payroll of the month being figured is needed for control purposes.

After obtaining the totals for each department of the headings as shown on the payroll sheets for the entire month, the journal entry is prepared, crediting the actual payroll figures for the month to the payroll accounts, and charging the various control accounts involved.

S. O. Burgdorf, mayor of Milford, Mich., discovered a mountain of pumice in Nevada last month and plans to organize a company to market pumice.

Editorials

Co-operation Needed in Gray Iron
Self Help Neglected by Jobbers

See Cloudless Business Sky Ahead
Volume Without Profits Is Futile

Opportunity Knocks!

NO GRAY iron foundryman can study the address of E. A. Custer Jr., delivered last week at the convention of the National Founders' association, without realizing that his industry is possessed of numerous latent possibilities for development. His word picture of the future castings establishment with improved products marketable in broader consuming fields is especially alluring at this time when so much is said and written of the present limited demand for castings and the apparent encroachment of competitive materials.

Mr. Custer's address is opportune in that it emphasizes the importance of the survey being conducted by the department of commerce to obtain fundamental statistics of the gray iron industry. These and other recent activities on behalf of the producers of gray iron castings reflect a growing determination to get to the bottom of the problems of the industry. They point more and more directly to the need of an organized movement to establish a "gray iron" consciousness among those who are logical customers of the castings shops.

In this day of keen competition between industries, products and methods, executives are rapidly awakening to the fact that their major business problems are external rather than internal. For the moment production, labor, and other matters within the organization are secondary to marketing, rivalry of competitive products and methods and other problems originating outside the company. No foundryman working independently can effectively combat these external attacks on his business. It is clearly a job for a co-operative body, and the sooner the gray iron foundrymen organize for research and market development, the better will be the prospect for stability and growth of the industry at large.

But organization alone will not cure present foundry ills. Urgently as gray iron foundrymen need a co-operative agency to combat their external problems, it would be a mistake to set up a research and marketing organization unless the members are determined to give it wholehearted and adequate financial and moral support. After all, the fate of the industry lies in the hands of the individual foundrymen.

Opportunity is knocking at the door of the gray iron industry. Have the individual foundrymen the vision and courage to launch an organization and the determination to see it through to success?

All Signs Favorable for 1928

THE crop of business forecasts for 1928 is being harvested unusually early. With a Brobdingnagian hurdle the economic crystal gazers have spanned the remaining six weeks of this year and conjured up what next year has in store. Thus far the portents have all been favorable.

Virgil Jordan, chief economist, National Industial Conference board, New York, advises preparedness for an unprecedented business boom. Col. Leonard P. Ayres, vice president, Cleveland Trust Co., Cleveland, foresees a gradual turn in business early in 1928 with strong activity in the fall. Alfred P. Sloan Jr., president, General Motors Corp., is certain automobile production next year will exceed this year. Julius H. Barnes, New York, former president of the chamber of commerce of the United States, believes the increased buying power of the farmer will have a telling effect.

Granted that long-range forecasting is not always fortunate and has no direct bearing upon the trend of business, still there is a lift and an elusive encouragement in it that appeals.

Sales Policies Are Short-Sighted

MILL competition, profitless prices and the drugstore scale of buying have been condemned without hesitation by iron and steel warehousemen and jobbers. Of all the factors contributing at present to an unhealthy

condition in the warehouse business, probably the most severely attacked is the pursuit of small lot business by mills. Warehousemen set themselves up as more capable of serving the small lot buyer and naturally include in their selling price a charge for such service.

That the jobber is not entirely right in blaming the mill for the present high degree of competition has been evidenced in the past on numerous occasions, and more recently on the alteration of pipe quotations. Mills making tubular products allowed their jobbers an extra 5 per cent discount on carload lots. Instead of accepting this larger margin to offset losses on other items, some of the jobbers immediately passed along to consumer part of the discount. So, instead of mills granting an extra 5 per cent to their jobber customers, in effect they reduced the price of pipe 2½ per cent, the amount which the jobber shaved from his resale price.

Another example longer in evidence has been the sales policies of some warehouses in handling wire nails and bolts and nuts. Some middle western jobbers have sold wire nails, bolts and nuts out of warehouse at lower than the mills. Where mills have been holding to 70 off on the bolt and nut list, with 1 per cent for payment in ten days, jobbers have offered 70 off with 2 per cent for prompt payment. Some jobbers explain the reason for such a condition by claiming that wire nails, bolts and nuts are similar to sugar, usually the "leader" of grocery stores. But no explanation has come from jobbers who have complained about mill competition and then have neglected to take advantage of the opportunity offered by the mills for increased profit on a product of stable price.

Full Order Book a Phantom

SELLING her wares at less than cost was possible, according to the old lady in the tale of childhood days, only because it enabled her to sell so much more goods. This seems to be the origin of the theory of volume of sales and its sister theory of the full order book at all costs.

The laugh at the old lady's philosophy is equally applicable to the iron and steel producer of today who cuts prices to keep his mill busy. Selling below cost of production has been known to be of value on a small percentage of output at the moment a buying movement has started. The same selling when consumers are not in the market is a losing game.

Dr. Julius Klein, director of the federal bureau of foreign and domestic commerce, in a recent address deplored the waste in effort and money in chasing some chimeras fashionable at the moment. Distribution has not been developed along scientific lines as production has advanced. Keeping production active at a loss is suicidal, it is more clearly seen.

Emphasis has been placed on efficient production and its problems have been largely solved. Equal improvement is possible in distribution. The business world seems to be a laboratory. From it may emerge a new understanding of the possibilities of economy in selling that will equal economies already attained in production. Consolidations of small units are being made; co-operation in buying is being experimented with as never before; chains of stores are spreading; mail order houses are using more of the ordinary retail methods; steel warehouses are being associated in chains.

Dr. Klein believes the department of commerce can aid business greatly by attacking problems of selling and distribution and making scientific analyses to determine principles. This will be of value to consumer, producer and distributor. This is almost a virgin field and promises large return for effort to unearth its secrets.

What Our Readers Are Thinking

Encouraging Employe-capitalists

SOME companies have encouraged their employes to invest in new issues of their securities for the purpose of supplying needed additions to capital. The willingness of employes during the war period to purchase savings stamps and Liberty bonds and the consequent knowledge of investments derived from these transactions has since led many companies to take advantage of this reservoir of funds to help finance their own business.

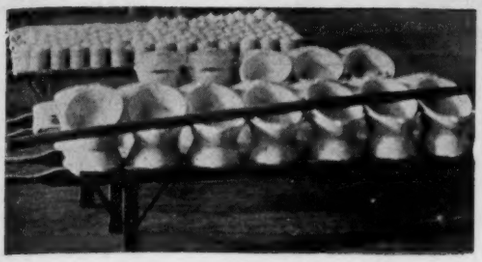
As an industrial group, light and power companies have probably gone farther than any other in offering their securities for this purpose. In some cases, the sale of stock for purposes of raising capital have been accompanied by sales campaigns in contra-distinction to the methods adopted by companies whose stock selling plans were motivated by a desire to reward employes for service, to stimulate their interest in the company or to encourage thrift among them.

Companies in other industrial groups, among which are small companies with a very limited market for their stock, have found their employes' savings an acceptable source of new capital. Then too, especially in the case of large public utility companies floating sizable issues, this method of procuring new capital eliminates brokerage and underwriting costs which results in a considerable increase in the amount of capital actually realized. MAGNUS W. ALEXANDER, *president, National Industrial Conference board, New York.*

IRON TRADE REVIEW

Volume 81 Number 21 — Published Every Thursday

E. L. SHANER, Editor. J. D. PEASE, Advertising Director. F. F. LIGHT, Circulation Manager.



Planning Enameling Shop for Quality Work. Page 1287

GRAY iron foundries are standing upon the threshhold of prosperity for the fire of discontent over business conditions is bringing about an awakened interest in technical procedure and the necessity for better marketing. In the timely articles on Page 1294, E. A. Custer Jr. tells of the changes which are to take place and the manner in which they are to be brought about. Among the factors which will play a most important part are metallurgy of cast iron, temperature control, sand conditions, permanent molds and cleaning methods.

The Readers' Page

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IRON TRADE REVIEW is published by the Penton Publishing Co., Cleveland, O. Member, Audit Bureau of Circulation; Associated Business Papers Inc.; and National Publishers Association. Branch offices: 1147 People's Gas Bldg., Chicago; 209 Edwards Bldg., Cincinnati; 2203-2206 No. 220 Broadway, New York; 2148-49 Oliver Bldg., Pittsburgh; 24 California street, San Francisco; 1653 Pennsylvania avenue, Washington; and Boston. Foreign offices: Prince's Chambers, Birmingham, Eng.; Caxton House, Westminster S. W. 1, London; 9 Rue de Londres, Paris, France; Wilhelmstrasse 114, Berlin, S. W. 48, Germany; Cable address: *PENTON*, Cleveland; *IROTRAPEN*, London. Terms: Subscription in United States, Cuba and Mexico, $6 per year; in Canada, $8.50 per year and in Great Britain and other countries, £2:0:0 per year. *Entered at the Postoffice at Cleveland as Second Class Matter.* *Copyright 1927 by the Penton Publishing Co.*

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The Business Trend

Forecasts Point To Upward Turn

By JOHN W. HILL, Financial Editor

WITH the turn of the year not far distant, expressions from high places in industry and finance are beginning to appear respecting the outlook for 1928. The tenor of these views, for the most part, is in curious contrast to the current gloom pervading many industrial sections.

IN SOME lines, operations are now curtailed, employment has fallen off somewhat and, for a good many industrial companies, earnings are low. Present indications point to developing improvement. Employment is gaining in the motor car manufacturing center and orders are expanding in some degree in the iron and steel trade. These tangible signs give added weight to the favorable predictions.

ONE of the most striking evidences of faith in the prospect was the recent distribution of a $65,000,000 dividend by the General Motors Corp. to its stockholders. That company profited this year from the temporary withdrawal of Ford from the market, but apparently its belief in the future is not dampened because its largest competitor expects soon to be producing.

JOHN J. RASKOB, chairman of the finance committee of General Motors, sees a good business for all next year. He predicts that, with Ford back in the market, the output of automobiles in 1928 will be 5,000,000 cars compared with the 3,500,000 to be produced in 1927.

THE occasion of Raskob's remarks was a dinner given for Prof. Edwin R. A. Seligman, of Columbia university, who has just completed an exhaustive research of instalment selling. In view of the great gnashing of teeth of a year or two ago over the disasters being brought on by instalment selling, Prof. Seligman's conclusions are interesting. He sees in it no weakness but rather an aid to progress.

COL. L. P. AYRES, of the Cleveland Trust Co., is another authority who has spoken upon the outlook. He says business is now upon a downward trend but that an upward swing is probable soon. He believes that in recent months production of steel, of motor cars and railroad equipment has been running below normal consumption and that accumulated demand in these lines will stimulate recovery.

The Barometer of Business

Industrial Indicators

	Oct., 1927	One month ago	One year ago	Monthly average 1913
Pig iron output (Daily average, tons)	90,652	92,720	107,000	83,900
Blast furnace index 60 pre cent = normal	48.4	50	58.5	62.8
Unfilled orders (tons)	3,341,000	3,148,113	3,685,000	4,513,000
Ingot output (Daily average, tons)	126,500	124,312	157,406	.....
Dodge Bldg., awards in 27 states (sq. ft.)	76,352,800	67,740,000	62,000,000	31,250,000
Automobile output	210,000	268,000	343,000	.....
Coal output, tons	44,012,000	41,950,000	54,000,000	39,869,000
Business failures; number	1,787	1,573	1,763	1,336
Business failures; liabilities	$36,235,872	$32,195,000	$33,230,000	$22,732,000
Cement production, Bbls.	17,174,000	17,492,000	16,596,000	7,704,000
Cotton consumption, bales	612,935	627,321	568,532	438,218
Car loadings (weekly average)	1,117,000	1,090,000	1,189,000	.....

Foreign Trade

	Oct., 1927	One month ago	One year ago	1913
Exports	$490,000,000	$426,000,000	$457,000,000	$194,000,000
Imports	$356,000,000	$341,000,000	$383,000,000	$149,900,000
Gold exports	$10,698,000	$24,489,000	$1,115,004	$5,234,000
Gold imports	$2,056,000	$12,970,000	$8,443,866	$5,900,000

Foreign Exchange

	Normal	Nov. 20, 1927	One month ago	One year ago
Sterling	$4.86	$4.87	$4.86	$4.84 7/8
Francs	19.3c	3.93c	3.92c	3.56c
Lira	19.3c	5.44c	5.46c	4.22c
Marks	23.8c	23.86c	23.85c	23.70c

Financial Indicators

	Oct., 1927	One month ago	One year ago	1913
25 industrial stocks	**$239.97	$241.36	$172.63	$58.19
25 Rail stocks	**$120.10	$120.60	$97.08	$82.90
42 Bonds	**$92.97	$92.32	$89.01	$93.00
Bank clearings (000 omitted)	$48,074,000	$45,840,745	$44,905,000	$13,895,000
Commercial paper rate (N. Y., per cent)	4-4¼	4-4¼	4½-4¾	5.60
*Commercial loans (000 omitted)	$8,836,654	$8,735,000	$8,798,852	.....
Federal reserve ratio, per cent	75	77	73.8	.....
Railroad earnings	†$132,770,000	$118,000,000	$145,000,000	$59,301,000
Stock sales, N. Y. stock exchange	50,289,449	51,576,590	40,437,374	6,924,000
Bond sales, par value	$252,767,700	$238,367,000	$219,671,450	$41,499,000

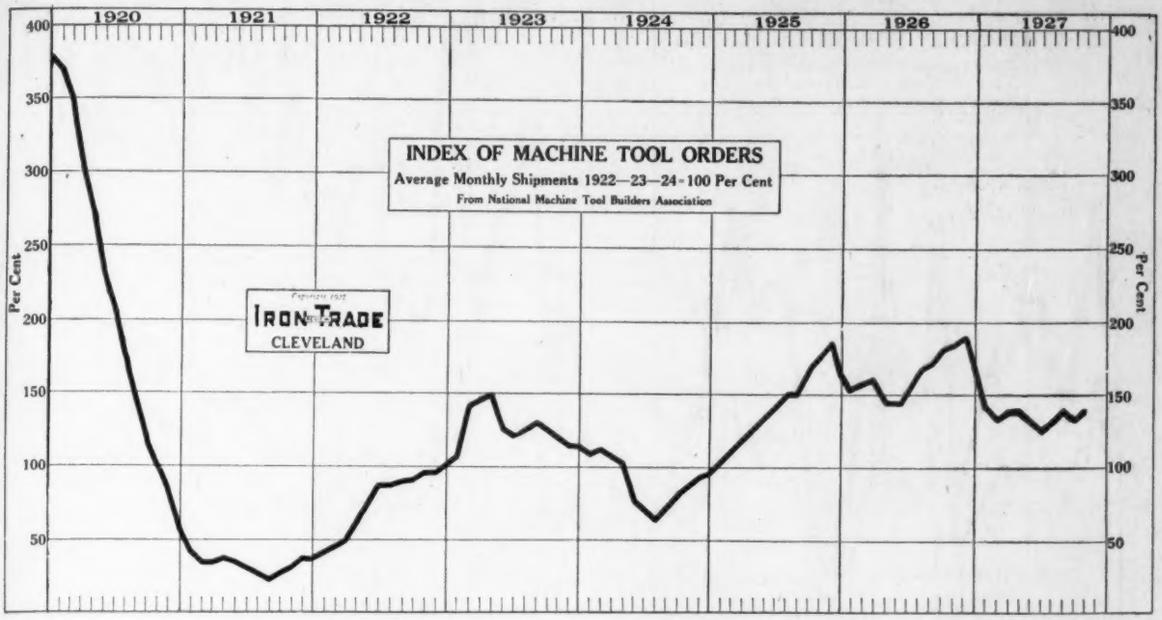
*Leading member banks Federal Reserve System.
†September, 1927.
**Nov. 22, 1927.

Commodity Prices

	Nov. 1, 1927	One month ago	One year ago	1913
U. S. Bureau of Labor Statistics	97	96.5	98	†100
Bradstreet's index	143	142	137.9	100
Economist's (British)	146	148	155.9	100
Wheat, cash (bushel)	$1.32	$1.29	$1.39	92c
Corn, cash (bushel)	84c	90c	71c	51c
Petroleum, crude (Bbl.)	$2.65	$2.65	$3.15	$2.50

†Average, 1926.

The Business Trend

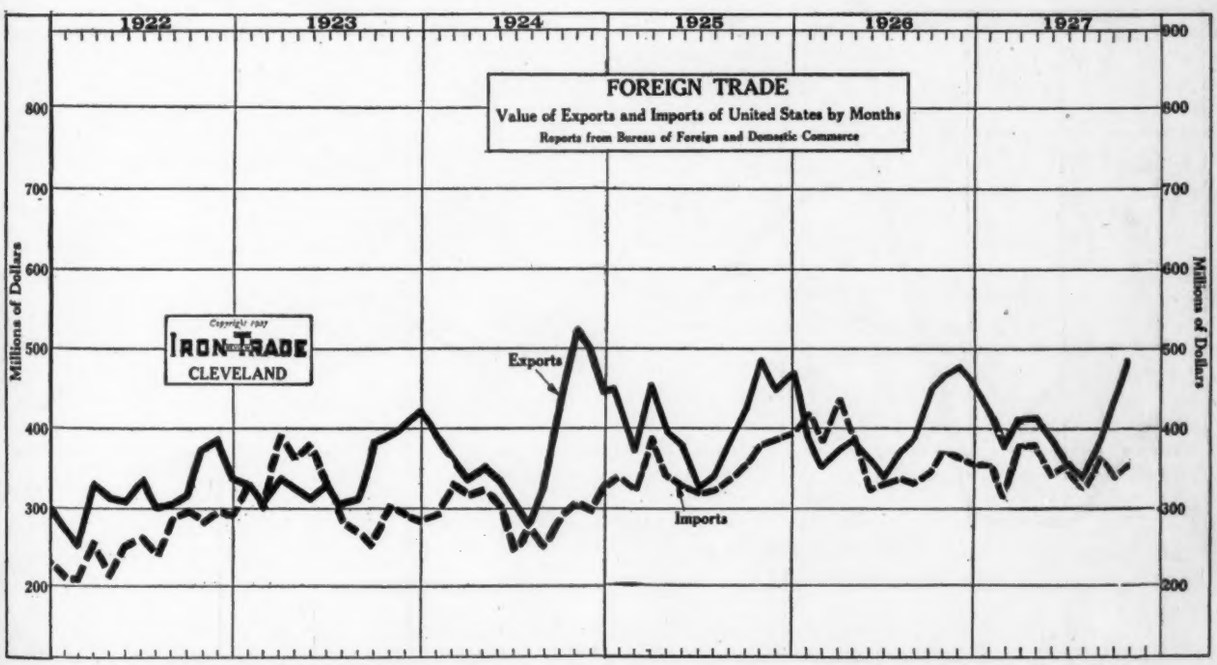


Machine Tool Index

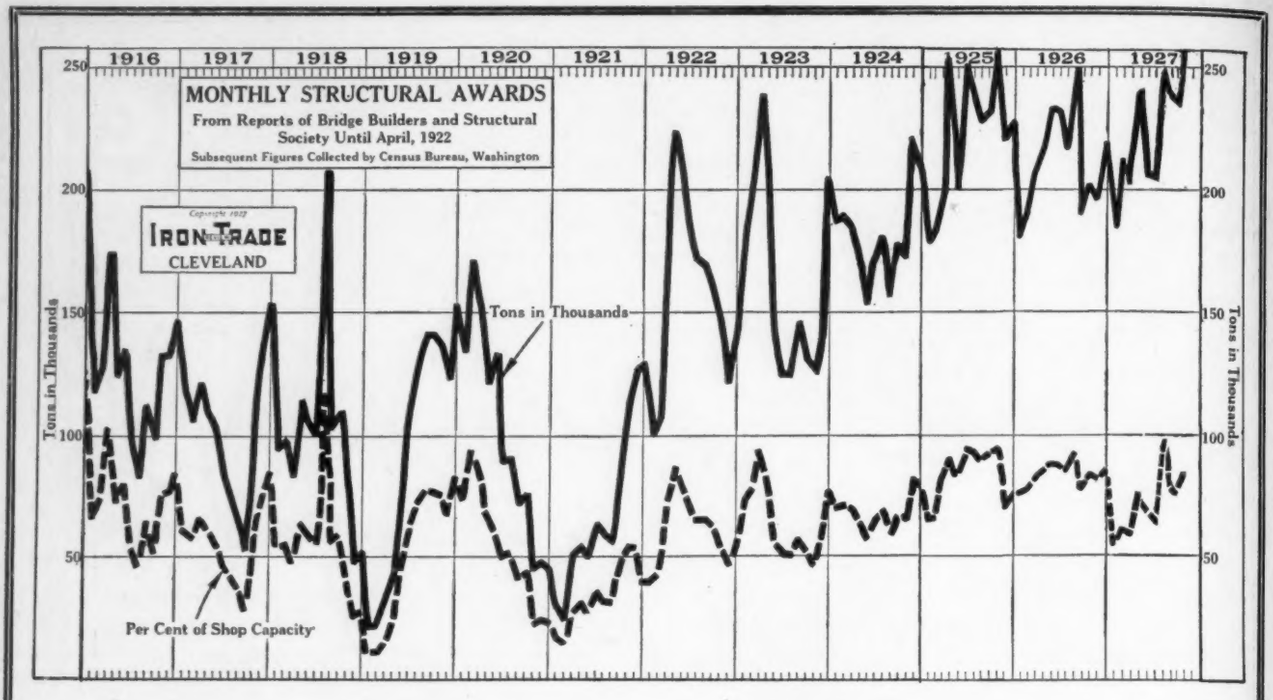
ORDERS for machine tools as computed by the National Machine Tool Builders' association, turned upward in October. The increase was enough higher to cause a slight gain in the three months' monthly average trend line. The index of orders as of October for the three months' moving average was 136.6 compared with 135 one month before. The upturn was due to the larger percentage of orders reported by members within the range of $10,000 to $50,000.

Foreign Trade

OCTOBER brought an increase in exports of American merchandise. The total amounted to $490,000,000 compared with $426,000,000 in September and with $457,000,000 in October, 1926. Imports of $356,000,000 compared with $341,000,000 in September and with $383,000,000 in the corresponding month one year ago. There was an excess of exports over imports for the month of $134,000,000 compared with an excess of $74,000,000 one year before.



The Business Trend

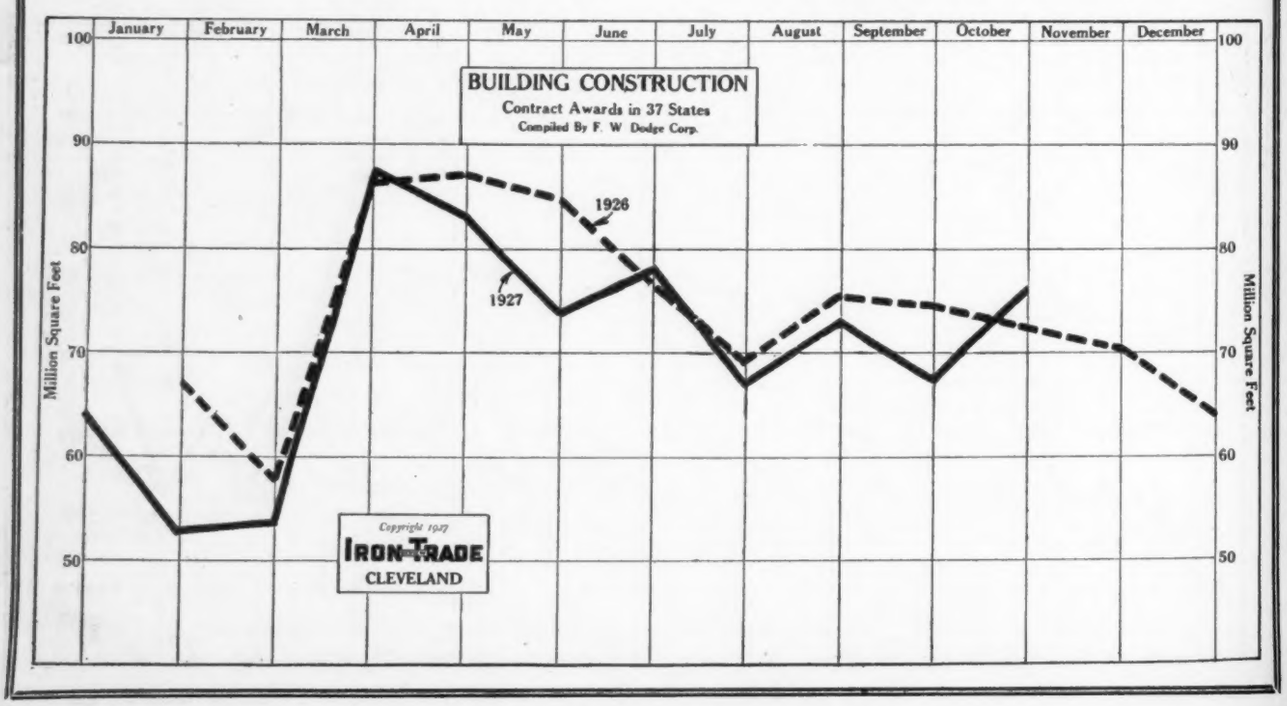

MONTHLY STRUCTURAL AWARDS
From Reports of Bridge Builders and Structural Society Until April, 1922
Subsequent Figures Collected by Census Bureau, Washington
Copyright 1927
IRON TRADE
CLEVELAND
Tons in Thousands
Per Cent of Shop Capacity
1916 1917 1918 1919 1920 1921 1922 1923 1924 1925 1926 1927
250 200 150 100 50

Structural Awards

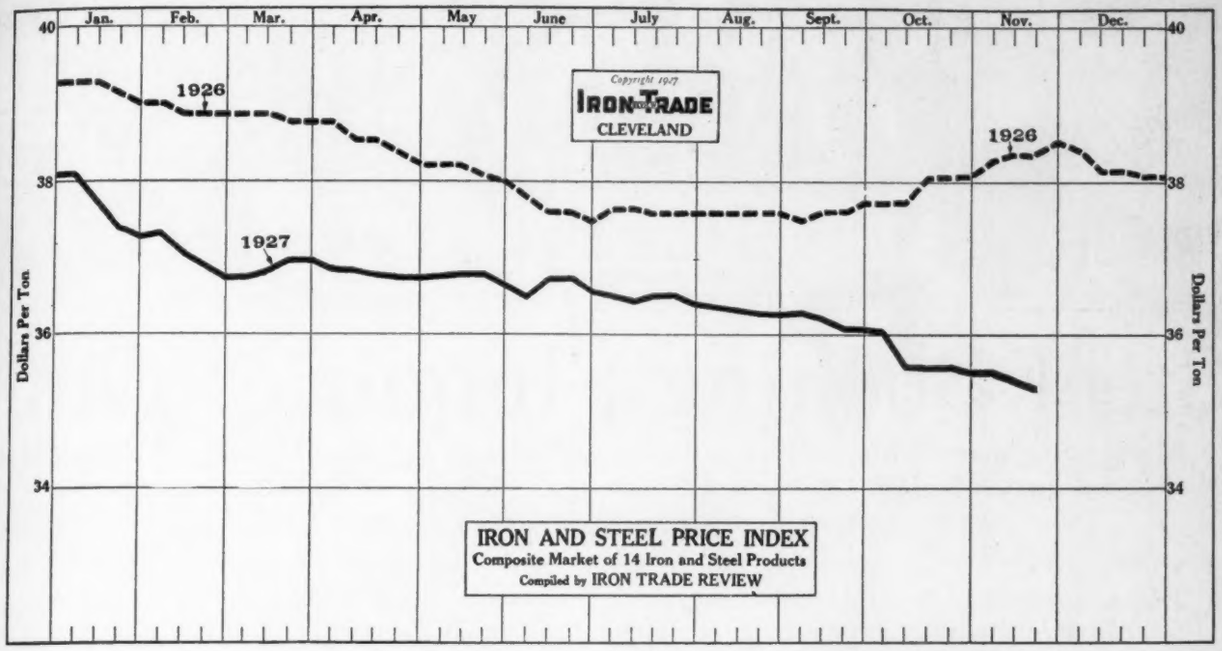
NEW orders on fabricated structural steel as reported to the Department of Commerce by leading manufacturers, reveal a marked increase in activity in this branch. Orders represented 83 per cent of capacity and the computed tonnage was 263,940 tons. One month before, percentage of capacity was 76 per cent and the tonnage was 241,680. In October, 1926, orders represented 64 per cent of capacity and the computed tonnage was 203,520 tons.

Building Construction

TOTAL building contracts awarded in 37 northeastern states, as reported by the S. W. Dodge Corp., amounted to 76,352,800 square feet in October. This was a new high record for that month. It compared 67,740,500 square feet in September and with 72,392,500 square feet in October, 1926. The estimated value of all new construction awards for the first ten months of the year totaled $5,359,297,000. This was an increase of $2,791,500 over the amount reported one year ago.



The Business Trend

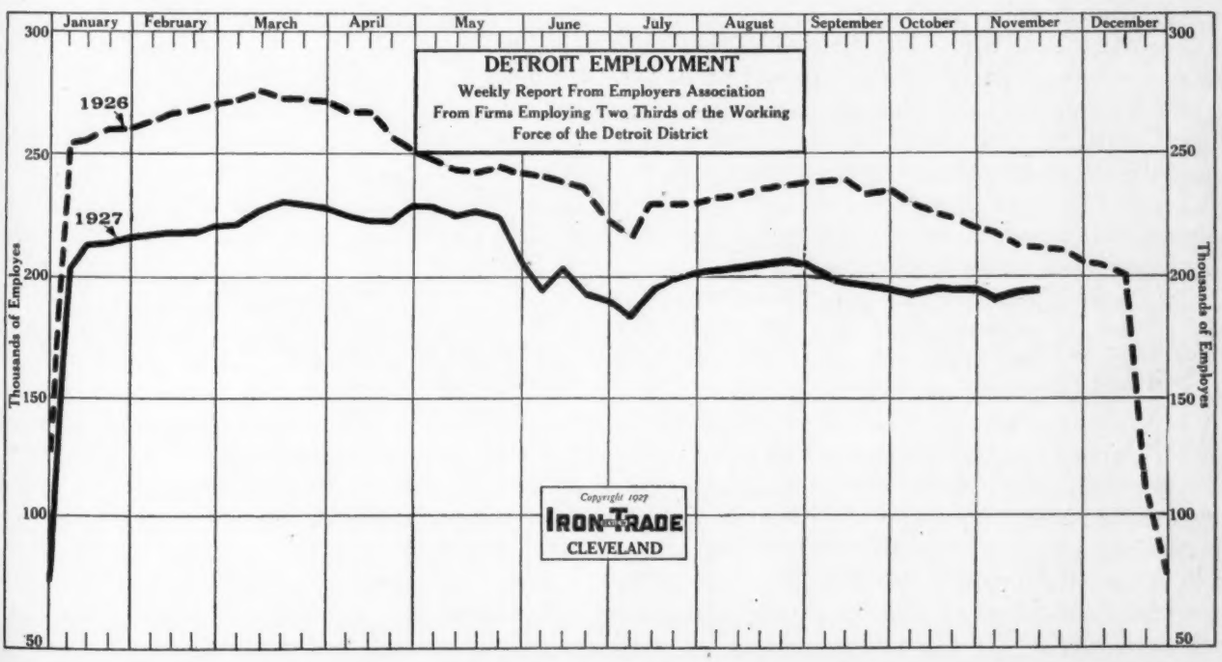


Steel Price Index

WITH an increase in demand for heavy steel products, encouraged by the $1.00 a ton advance and with a brighter situation appearing in the pig iron market, indications are pointing to an end of the extended decline of iron and steel prices. The market level is now at a depression level, being nearly as low as the bottom of the fall in quotations in 1921 and 1922. For some products including black and galvanized sheets and tin plate shading of prices has continued.

Detroit Employment

ONE of the most significant indications of the present situation is to be found in the record of employment in the Detroit district. Because of the great importance attached to activities in the automobile industry this year it is notable that recent weeks have brought an increase in employment in that motor car center. This is in sharp contrast with the gradual decline during November, 1926, and a drastic decline during December, 1926.



Steel Bookings, Inquiries Gain

Market Sentiment is More Cheerful as Many Producers Cover and Heavy Pipe Business Continues — Freight Car Inquiry Totals 9350 — Pig Iron Promises More Activity — Sheet Prices Easy — Producers Stand on Plate, Shape, Bar Advance

CONFIDENCE in the long pull, which has been growing among producers of steel, received substantial reinforcement this week. Not only has new business displayed encouraging expansion but fresh and prospective inquiry also has registered marked gains. Even in those departments of the industry which still tend to drag, the morale is noticeably better.

Heavy finished steel products have been the chief beneficiary of this improvement, with an accompanying tendency toward firmness in price. The lighter steel products continue unstable in price and in comparatively light demand. The corrective of this condition—accelerated automotive buying—is believed closer. Demand for steel pipe continues at the record-breaking pace of recent weeks, purchasing of 1928 track material still is seasonably high, and freight car inquiry is the heaviest since mid-summer.

Operations of Steel corporation subsidiaries average 69 per cent this week, a recession of two points. Curtailed schedules of independent producers, especially in the Mahoning valley, drag the national steelmaking average down to 65 per cent. But if orders continue to develop from sources that appeared dried up a few weeks ago, operations may follow sentiment upward.

Pig Iron Is Stirring

Pig iron has not made the strides of finished steel in the past week but the outlook continues propitious. Closing of a sanitary ware manufacturer's inquiries for foundry iron for its Pittsburgh district plants will probably precipitate demands from other large melters. Furnace interests contend further concessions are not compatible with current costs. It develops that in the southern selling campaign, now ended, Birmingham district producers booked well over 150,000 tons. Inquiry in the Cincinnati and Indianapolis districts has been vigorous. Automotive foundries are expected to take heavier shipments after mid-December. Greater price firmness is manifest at Buffalo. Eastern Pennsylvania melters who are good at guessing the bottom of the market are buying.

Freight Car Needs Big

With the Santa Fe railroad out for 3750 freight cars, the Louisville & Nashville for 2250 and the Chicago & Eastern Illinois for 500, pending freight car inquiry totals 9350. Nearly 68,000 tons of rails and 25,000 to 30,000 tons of track fastenings have been distributed by western carriers in the past week. Probably 300,000 tons of 1928 rails remains to be placed. Rail mills at Chicago are going on higher schedules.

Except in isolated cases, producers of plates, shapes and bars are entering all new business on the basis of 1.80c, Pittsburgh, and 1.90c, Chicago. Efforts to obtain the $2 differential on small business have been no more successful than previous ones. In some districts first quarter business is being booked at current quotations and extensions to contracts at lower levels are being refused. Bars again lead the heavy finished market at Chicago in spite of improved demand for plates, including 7000 tons of tankage.

Pipe Inquiry Still High

Projected gas lines in the West and Southwest call for over 200,000 tons of steel pipe, while 50,000 tons is pending in oil lines. Bids will be taken shortly on the first unit of 3000 tons of a 12,000-ton riveted pipe line in New Jersey. A similar project in the same state, requiring 30,000 tons, will be up early in January.

Structural steel and reinforcing concrete bars reflect seasonal lethargy, although 30,000 tons of shapes are up at New York in various transportation jobs.

The Market Section

Comparative Prices of Iron, Steel and Coke

Representative Market Figures for This Week, Last Month, Three Months and One Year Ago

	Nov. 23, 1927	Oct. 1927	Aug., 1927	Nov., 1926
PIG IRON				
Bessemer, valley, del., Pittsburgh	$19.76	19.76	20.26	22.01
Basic, valley	17.00	17.00	17.50	18.75
Basic, eastern del., eastern Pa.	19.50	19.50	19.75	22.50
*No. 2 foundry, del., Pittsburgh	19.26	19.26	19.26	21.36
No. 2 foundry, Chicago	18.50	18.75	19.50	21.00
*Southern No. 2, Birmingham	16.00	17.25	17.25	20.00
*Southern Ohio, No. 2 Ironton	20.00	19.00	19.00	20.00
**No. 2X, Virginia furnace	21.25	21.50	21.50	22.75
**No. 2X, eastern, del. Phila.	20.51	20.66	21.26	23.51
Malleable, valley	17.50	17.50	17.50	19.75
Malleable, Chicago	18.50	18.75	19.50	21.00
Lake Superior charcoal, del. Chicago	27.04	27.04	27.04	27.04
Gray forge, val., del., Pittsburgh	18.76	18.76	18.76	21.01
Ferromanganese, del., Pittsburgh	94.79	94.79	94.79	104.79
*1.75 to 2.25 silicon. **2.25 to 2.75 silicon.				
COKE				
Connellsville, furnace, ovens	2.75	2.85	3.00	4.75
Connellsville, foundry, ovens	3.75	3.75	4.00	5.85
SEMIFINISHED MATERIAL				
Sheet bars, open-hearth, Youngstown	34.00	34.00	33.75	36.00
Sheet bars, open-hearth, Pittsburgh	34.00	34.00	33.50	36.00
Billets, open-hearth, Pittsburgh	33.00	33.00	33.00	35.00
Wire rods, Pittsburgh	40.00	42.50	43.00	45.00
FINISHED MATERIAL				
Steel bars, Pittsburgh	1.80	1.75	1.80	2.00
Steel bars, Chicago	1.85	1.85	1.95	2.10
Steel bars, Philadelphia	2.12	2.07	2.12	2.32
Iron bars, Philadelphia	2.07	2.07	2.12	2.22
Iron bars, Chicago	1.85	1.90	2.00	2.00
Shapes, Pittsburgh	1.80	1.75	1.80	2.00
Shapes, Philadelphia	2.12	2.07	2.02	2.22
Shapes, Chicago	1.85	1.85	1.95	2.10
Tank plates, Pittsburgh	1.80	1.75	1.80	1.90
Tank plates, Philadelphia	2.12	2.07	2.12	2.22
Tank plates, Chicago	1.85	1.85	1.95	2.10
Sheets, black, No. 24, Pittsburgh	2.75	2.95	3.00	3.10
Sheets, blue anl., No. 10, Pittsburgh	2.10	2.15	2.25	2.40
Sheets, gal., No. 24, Pittsburgh	3.60	3.80	3.85	3.95
Sheets, black, No. 24 Chicago	2.95	3.10	3.15	3.25
Sheets, blue anl., No. 10, Chicago	2.30	2.35	2.40	2.55
Sheets, galvanized, No. 24, Chicago	3.85	3.95	4.00	4.10
Wire nails, Pittsburgh	2.50	2.55	2.55	2.65
Wire nails, Chicago	2.60	2.60	2.60	2.70
Tin plate per base box, Pittsburgh	$5.30	5.30	5.50	5.50
OLD MATERIAL				
Heavy melting steel, Pittsburgh	14.25	14.50	15.00	17.00
Heavy melting steel, eastern Pa.	14.00	14.00	13.75	15.95
Heavy melting steel, Chicago	11.50	11.75	12.35	13.00
No. 1 wrought, eastern Pa.	15.75	15.75	15.95	17.00
No. 1 wrought, Chicago	11.25	11.40	13.45	14.10
Rails for rolling, Chicago	13.50	14.70	15.00	16.50

Composite Market Average

The Fourteen Leading Iron and Steel Products Included are Pig Iron, Billets, Slabs, Sheet Bars, Wire Rods, Steel Bars, Plates, Structural Shapes, Black, Galvanized and Blue Annealed Sheets, Tin Plate, Wire Nails and Black Pipe

This week (November 23, 1927)....$35.24
Last week (November 16, 1927)....35.36
One month ago (October, 1927)....35.67
Three months ago (August, 1927)....36.25
One year ago (November, 1926)....38.43
Ten years ago (November, 1917)....58.29
Fourteen years ago (November, 1913)....24.02

Iron and steel scrap has shaken off the extreme weakness of recent months and while no definite upturn is apparent, a turn for the better may be in the making.

Sheet prices continue to ease off, especially in the East. The top of the galvanized market is now 3.65c, Pittsburgh, while 2.10c has become more general than 2.15c on blue annealed. Black sheets show a wide range, with 2.80c about the top. Some makers claim to be refusing first quarter orders at current minimum prices.

In both cold finished bars and strip steel slight gains in new business are reported, although the price situation, especially in strip, continues unsteady.

Largely because of declining sheet prices, the IRON TRADE REVIEW composite of fourteen leading iron and steel products has declined 12 cents in the past week to $35.24. This gives November thus far an average of $35.39, compared with $35.67 in October and $38.43 last November.

Late News Flashes

Rail Tonnage Boosts Chicago Steel Rate

Chicago, Nov. 22.—Scheduling of additional rail tonnage is stimulating steelworks operations, the rate now being about 65 per cent. Rail mill operations have been advanced slightly and now are about 45 per cent for the district. The leading interest has 12 of its 27 blast furnaces active—six at Gary, five at South Chicago, and one at Joliet. Twenty of the 36 steelworks furnaces in the district are active.

Bethlehem Complaint Report Completed

Washington, Nov. 22.—J. W. Bennett, of the federal commission's board of review, has submitted his report in the Bethlehem merger complaint. Four other members of the board are scanning the report before it goes to the full commission. Considerable time probably will elapse before the commission makes its final decision.

May Act on Gary Vacancy

New York, Nov. 22.—The report gains credence that action will be taken by directors of the United States Steel Corp., Nov. 29, in appointing a successor to the late Judge E. H. Gary. Some believe that James A. Farrell will be confirmed as chief executive officer and that Myron C. Taylor will head the finance committee. J. P. Morgan returned from Europe today.

Production Declines at Valley Mills

Youngstown, O., Nov. 22.—Steelworks operations, including sheet mills, are slightly lower than last week. Open hearth activities are 43 per cent, against 45 last week. Independent sheet mills are operating this week at 51 per cent, against 57 per cent last week. Tin plate output has gained 10 points, to 75 per cent. Strip mill activities have increased about 5 per cent. Independent steel bar mills continue irregular.

Current Rolled Steel Prices

PRICES, CENTS PER POUND, UNLESS OTHERWISE STATED

Semifinished Material

Prices per gross ton

BILLETS AND BLOOMS

4 x 4-inch base

Pittsburgh, open-hearth	$33.00
Pittsburgh, bessemer	33.00
Youngstown	33.00
Cleveland	33.00
Philadelphia	33.30 to 39.30
Chicago	33.00
Forging, Pittsburgh	39.00
Forging, Philadelphia	43.30 to 44.30

SHEET BARS

Pitts., Young., and Cleve.	$34.00

SLABS

Pitts., Young., and Cleve.	$33.00

WIRE RODS

Pittsburgh	40.00 to 43.00
Cleveland	40.00
Chicago	42.00 to 43.00

Standard extras, $5 for screw stock: $15 for acid wire rods. Carbon extras, $3 for 0.20 to 0.40; $5 for 0.41 to 0.55; $7.50 for 0.56 to 0.75; $10 over 0.75.

SKELP

All grades, Pittsburgh	1.80c

Standard Structural Shapes

Pittsburgh	1.80c
Philadelphia	2.12c
New York	2.09c to 2.14c
Chicago	1.85c to 1.90c
Cleveland	1.99c
Birmingham	1.95c to 2.05c
Pacific coast, c.i.f.	2.40c

Steel Plates

Pittsburgh	1.80c
Philadelphia	2.12c
New York	2.14c
Chicago	1.85c to 1.90c
Cleveland	1.99c
Birmingham	1.95c to 2.05c
Pacific coast, c.i.f.	2.40c

Iron and Steel Bars

Pittsburgh, soft steel	1.80c
Pittsburgh, cold finishing	1.95c
Pittsburgh, forging quality	1.95c
Philadelphia, soft steel	2.12c
New York, soft steel	2.14c
Chicago, soft steel	1.85c to 1.90c
Cleveland, soft steel, mill	1.75c to 1.80c
Cleveland, soft steel, del.	1.80c to 1.99c
Birmingham, soft steel	1.95c to 2.05c
San Francisco, soft steel	2.35c to 2.40c
Pittsburgh, refined iron	2.75c to 4.25c
Pittsburgh, reinforcing billet	1.80c to 1.90c
Chicago, reinforcing billet	2.20c to 2.30c
Chicago, reinforc. rail steel	1.80c to 1.85c
Youngstown, reinf. billet, base	1.90c to 2.00c
Chicago, rail steel	1.80c to 1.85c
Mill, rail steel	1.65c to 1.75c
Philadelphia, common iron	2.07c to 2.22c
New York, common iron	2.09c to 2.24c
Chicago, common iron	1.85c to 1.90c

Hoops, Bands, Strips

Hoops, Pitts., 6 in. and under	2.20c to 2.30c
Bands, Pitts., 6 in. and under	2.20c to 2.30c
Bands, Pittsburgh, over 6 in.	2.00c to 2.10c
Hot rolled strip, Pitts., stamping quality, over 6 in.	1.95c to 2.10c
Hot rolled strip steel, Chicago	2.10c to 2.40c
Bands, Chicago, under 6-in.	2.30c to 2.40c
Bands, Chicago, 6 in. and over	2.10c to 2.20c
Cold rolled strip steel, hard coils, 1½ inches and wider by 0.100-inch and heavier base, Pittsburgh, Cleveland (less than 3 tons)	3.00c to 3.25c
Worcester, Mass	3.40c
Stripsheets, with blue annealed extras, 12 in. and wider, Pittsburgh	2.15c to 2.25c

Cold Finished Steel

Cold finished steel bars, drawn or rolled, Pitts., Chi., c. l.	2.10c to 2.20c
Steel shafting, Pittsburgh, Chicago	2.30c
Cold finished steel bars, Cleve.	2.10c to 2.25c

Chain, Piling, Cut Nails

Cut nails, c.l., f.o.b. Mills	2.80c
Chain, 1-in. proof coil, Pitts.	6.00c
Sheet piling base, Pittsburgh	2.20c to 2.25c

Alloy Steel

Hot Rolled

F.o.b. Pittsburgh or Chicago

To Tonnage Users in Auto. Industry

S.A.E. Series Numbers	100 lbs. Bars
2100 (*½ per cent Ni 0.10 to 0.20 per cent C.)	$2.90 to 3.00
2300 (3½ per cent nickel)	4.10 to 4.25
2500 (5 per cent nickel)	5.00 to 5.10
3100 (Nickel chromium)	3.10 to 3.20
3209 (Nickel chromium)	4.50 to 4.75
4100 (Chromium molybdenum)	3.05 to 3.15
4100 (Cr. Mo. 0.25-0.40)	3.90 to 4.05
4615 (Ni. 1.50%; Mo. 0.10-0.20)	4.25 to 4.50
5100 (Chromium steel)	3.10 to 3.20
6100 (Cr. V., forging)	4.00 to 4.10
6100 (Cr. V., spring)	3.60 to 3.80
9200 (Silico Mang., spring steel)	3.00 to 3.20
9250 (Silico Mang., spring steel)	3.00 to 3.10
Ni. Cr. V., (Ni. 1½%, Cr. 1% V. 0.15%)	4.00 to 4.10

*Mill number not formally accepted by S. A. E.

Hot rolled alloy billets 4 x 4-inch and over take the same prices per gross tons as same specification of alloy bars per net ton. Sizes from 4 x 4-inch down to 2½ x 2½-inch take same basis plus $5 a ton extra. Billets smaller than 2½ x 2½-inch take bar price on net ton basis.

Cold Rolled

Cold rolled alloy steels take 1c a pound extra over hot rolled when mean carbon is 0.30 or under. When the carbon is above 0.30 the extra for cold rolled is 1.75c, including annealing.

Sheets

SHEET MILL BLACK

No. 24, Pittsburgh base	2.75c to 2.80c
No. 24, Philadelphia, delivered	3.07c to 3.17c
No. 24, Gary, Indiana Harbor	2.90c to 3.00c
No. 24, Chicago, delivered	2.95c to 3.05c
No. 24, Birmingham, base	3.05c

TIN MILL, BLACK

No. 28, Pittsburgh	2.90c
No. 28, Gary base	3.00c

GALVANIZED

No. 24, Pittsburgh base	3.60c to 3.65c
No. 24, Philadelphia delivered	3.97c to 4.07c
No. 24, Gary, Indiana Harbor	3.80c to 3.90c
No. 24, Chicago, deliyered	3.85c to 3.95c
No. 24, Birmingham, base	3.90c

BLUE ANNEALED

No. 10, Pittsburgh, base	2.10c to 2.15c
No. 10, Philadelphia, delivered	2.42c to 2.47c
No. 10, Gary, Indiana Harbor	2.25c
No. 10, Chicago, delivered	2.30c
No. 10, Birmingham, base	2.30c

AUTOMOBILE

No. 28, Pittsburgh, base	4.15c

IRON

No. 10, Pitts., blue ann., c.l.	2.90c
No. 24, Pitts., box annealed, 1-pass cold rolled, carload	3.85c
No. 24, Pitts., gal., c.l.	4.85c

Tin and Terne Plate

Prices per 100-pound box, Pittsburgh

*Tin plate, coke base	$5.30 to 5.50

Gary, Ind., base 10 cents higher.

Long ternes, primes, No. 24	4.20c

*Prices subject to quantity differentials.

Wire Products

To Jobbers in Carloads

Dealers 5 cents per 100 pounds extra

F.O.B. Cleveland and Pittsburgh base

Bright plain wire, No. 9 gage	2.40c
Annealed fence wire	2.55c
Galvanized wire, No. 9 gage	3.00c
Barbed wire, painted	3.00c
Barbed wire, galvanized	3.25c
	Per 100 lbs.
Wire nails	$2.50 to 2.55
Galvanized nails	4.50 to 4.55
Polished staples	2.95 to 3.00
Galvanized staples	3.20 to 3.25

Coated nails, 100 lb. kegs, subject to Sept. 1, 1926, extra card over wire nail base, 2.50 to 2.55

Woven wire fencing (retailers) 12½ gage, 26-in. high 7-in. bars and 12-in. stays, per 100 rods, f.o.b. Pitts. $20.03

Joliet, DeKalb and Waukegan, Ill., Anderson, Ind., and Chicago prices $1 per ton over Cleveland-Pittsburgh base on products made there; Duluth $2 higher, Worcester, Mass., and Fairfield, Ala., $3 higher.

Rails, Track Material

Standard bessemer rails, mill	$43.00
Standard open-h'th rails, mill	43.00
Relaying rails, St. Louis	24.00 to 31.00
Relay, rails, Pitts., 60 to 70 lb.	25.00 to 27.00
Light rails, 25 to 45, mills	36.00
Angle bars, Chicago base	2.75c
Spikes, railroad, Pittsburgh	2.80c
Spikes, small railroad, 7-16-inch and smaller, Pitts.	2.80c
Spikes, boat and barge, Pitts.	3.10c
Spikes, railroad, Chicago	2.80c
Track bolts, Pitts. stand	70 off list
Track bolts, Chicago	3.80c
Tie plates, Chicago, Pitts.	2.25c

Iron and Steel Pipe

Base Discounts Pittsburgh and Lorain, O. to Jobbers in Carloads

	Black	Galv.
1 to 3-inch butt steel	62	50½
1 to 1½-inch, butt iron	30	13

Indiana Harbor, Ind., and Evanston, Ill., 2 points less, Chicago del, 2½ points less.

Boiler Tubes

Less Carload Discounts—Carloads 4 Points Additional—F.o.b. Pittsburgh Mills

Steel 3¼ to 3¾-inch	38½
Charcoal iron, 3¼ to 4½-inch	5
Seamless hot rolled 3¼ to 3½-inch	46 off

Further discounts of seven 5 per cents for carloads or six 5 per cents for less-carload, on lap welded steel. On seamless hot rolled several more 5 per cents, and on charcoal two 10 per cents to two 10 and one 5 per cents.

Cast Iron Water Pipe

Prices per net ton

Class B Pipe

Six-inch and over, Birming'm	$29.00 to 30.00
Four-inch, Birmingham	33.00 to 34.00
Four-inch, Chicago	40.20 to 42.20
Six-inch to 24-inch, Chicago	36.20 to 38.20
Four-inch, New York	40.25 to 41.60
Six-inch and over, New York	37.25 to 38.25
Standard fittings, Bir. base	$100.00

6 to 24-inch, base; over 24-inch, plus $20; 4-inch, plus $20; 3-inch, plus $20; gas pipe fittings, $5 higher.

Class A pipe is $4 higher than Class B

Bolts and Nuts

F.o.b. basing points, Pittsburgh, Cleveland, Birmingham and Chicago.

Discounts are for legitimate jobbing or large consuming trade purchasing in full-case lots, apply to lists of April 1, 1927.

Small lots are 55 to 60 per cent off.

CARRIAGE BOLTS

All sizes, cut thread	70 off

Rolled thread ⅝x6 and smaller take 10 per cent lower list.

Eagle list	70 off

MACHINE BOLTS

All sizes, cut thread	70 off

Rolled thread ⅝x6 and smaller take 10 per cent lower list.

Lag screws	70 off
Plow bolts, Nos. 1-2-3-7 heads	70 off
Tap bolts	70 off
Blank bolts	70 off
Stud bolts without nuts	70 off

Stove bolts, 80-10-5 off in packages; 80-10-5 with 2½ off in bulk.

Tire bolts	60-5 off

NUTS

Semifinished	70 off

HEXAGON CAP SCREWS

Milled	80-10-10 off
Upset 1-in. diam. and smaller	85-5 off

SQUARE HEAD SET SCREWS

Milled	80-10 off
Upset, 1-in. diam. and smaller	80-10-10 off

Rivets

Structural rivets, carloads, Pittsburgh and Cleveland	2.75c to 3.00c
Structural rivets, c.l., Chicago	2.85c to 3.10c

**Rivets, 7/16-inch and smaller, Pittsburgh, Cleveland and Chicago 70 and 10 to 70, 10 and 5 off

**Some makers quoting 70 off with freight allowed on 300 pounds or more.

Washers

Wrought c.l., Chicago dist.	$6.70 to 6.90 off
Wrought c.l., Pitts. dist.	6.75 off
Lock washers (dealers')	85-5 off
Lock washers (consumers)	85 off

Pig Iron

Sales Register Only Fair Improvement but Sentiment is Much Better—First Quarter Interest Grows—Prices Unchanged

DETERMINATION of the price to be paid by the Standard Sanitary Mfg. Co. for its Pittsburgh district plants may have a sequel in issuance of inquiries by other melters. Sales at Cleveland reach 25,000 tons for the week, a gain of 10,000 tons. Automotive foundries are expected to attain a heavier melt in mid-December. Buying is quieter at Birmingham after a campaign that netted over 150,000 tons. Mystic furnace has sold 2800 tons into New England. Buffalo claims that less than $17 for No. 2 foundry has practically disappeared. A more active market is reported at New York, where the week's sales approximated 10,000 tons, including one order for 5000 tons. Shipments at St. Louis are better than sales. First quarter sales in Chicago show a steady accretion.

PITTSBURGH, Nov. 22.—Standard Sanitary Mfg. Co. is in quiring for 3000 to 9000 tons of three grades of foundry iron for its Allegheny and New Brighton, Pa., plants, in addition to approximately 5000 tons for its Louisville, Ky., plant. It purchased tonnage two weeks ago for its Baltimore plant from a steel interest near there. Many consumers are believed awaiting determination of prices on these inquiries. Steelworks and merchant furnaces claim to be adhering to $17.50, valley, for the base foundry grade and claim the situation different than when the market stood at $21 or even at $19. They maintain prices now are at an irreducible minimum, one merchant stack asserting to be losing $1 per ton on a $17.50 market. A sale of 100 tons of No. 3 foundry was made at $17, valley. Sales of bessemer show further shrinkage at $18, valley. Basic is nominal at $17, valley. Shenango resumed Nov. 19 after being banked 10 days.

Boston, Nov. 22.—Buffalo iron holds firm in this market at $17, despite the report of $16.50. The most important interests state the $17 price is general, with differentials of 50c on No. 2X and $1 on No. 1X. Mystic Iron Works has completed a satisfactory week, with sales totaling 2800 tons in New England. The largest sale was 500 tons. This was all on the $19, minimum, though Mystic continues to get $21 on diversified shipments outside of New England. Little interest appears in first quarter tonnage.

New York, Nov. 22.—Pig iron is more active, due particularly to closing of one lot of about 5000 tons of foundry. Burnham Boiler Corp. is expected to close this week for about 1000 tons of foundry iron for plants at Elizabeth, N. J., and Lancaster, Pa. Thatcher Furnace Co. wants about 500 tons of foundry iron for its Garwood, N. J., plant. Several other round tonnages are expected to come out this week. There also is quite a good demand made up of small lots. It is estimated that sales during the past week have totaled 9000 to 10,000 tons, much bigger than the average of recent weeks. Prices continue $19 to $19.50, base, eastern Pennsylvania furnace, while Buffalo foundry is $17, base, furnace. There have been reports of lower prices on Buffalo iron for this district but there does not seem to be any definite instance where standard foundry iron has been sold at less than $17, Buffalo. Dutch and Indian foundry iron continue to be sold in this district at $21 to $22, duty paid, tidewater. American Car & Foundry Co. wants several hundred tons of No. 2 plain and gray forge iron for Berwick, Pa.

Pig Iron Prices

Per gross ton

Bessemer, valley furnace	$18.00
Bessemer, del. Pittsburgh	19.76
Basic, valley furnace	17.00
Basic, del., Pittsburgh	18.76
Basic, Buffalo furnace	17.00
Basic, del., eastern Pa.	19.50 to 20.00
Malleable, valley furnace	17.50
Malleable, del., Pittsburgh	19.26
Malleable, del., Cleveland	18.50
Malleable, Chicago furnace	18.50
Malleable, Buffalo furnace	17.50
Malleable, del., eastern Pa.	20.25 to 20.75
No. IX, eastern del., Phil.	20.76 to 21.26
No. IX, Buffalo furnace	18.00 to 18.50
No. 1 foundry, Chicago furnace	19.00
No. 2 foundry, valley furnace	17.50
No. 2 foundry, del., Pittsburgh	19.26
No. 2 fdy., Everett, Mass., fur.	19.00 to 21.00
No. 2 foundry, Buffalo furnace	17.00
No. 2 foundry, Chicago furnace	18.50
No. 2 foundry, Granite City	19.50 to 20.00
No. 2 foundry, Ironton furnace	19.00 to 19.50
No. 2 foundry, del., Cleveland	18.50
No. 2 foundry del., Phila.	19.76 to 20.26
No. 2 foundry, N. J., tidewater	19.78 to 21.76
No. 2 foundry, east. N. Y. fur.	18.00 to 20.00
No. 2X east. N. J., tidewater	19.78 to 22.26
No. 2X, eastern del., Phila.	20.26 to 20.76
No. 2X, foundry, Buffalo furnace	17.50
No. 2X, eastern del., Boston	23.15 to 24.15
No. 2 Alabama, Birmingham	16.00
No. 2 Alabama, del., Cincinnati	19.69
No. 2 Tenn., Birmingham base	16.00
No. 2 Tenn., del., Cincinnati	19.69
No. 2 Alabama, del., Philadelphia	22.01
No. 2 Alabama, del., Chicago	22.01
No. 2 Ala., del. Chicago river-rail	20.18
No. 2 Ala., del. Boston, rail-water	24.16 to 25.16
No. 2 Alabama, del. Cleveland	22.01
No. 2 Alabama, del. St. Louis	20.42
No. 2X, Virginia furnace	21.25
No. 2X, Virginia, del. Phila.	26.04
No. 2X, Virginia, del., Jersey City	26.37
No. 2X, Virginia, del. Boston	26.71
Gray forge, val., del., Pittsburgh	18.76
Low phos., standard, valley	27.50
Low phos., standard, Phila.	24.76 to 27.79
Low phos., copper bearing fur.	23.00 to 24.00
Charcoal, Birmingham	29.00
Charcoal, Superior, del. Chicago	27.04

Silvery iron, Jackson county, Ohio furnace, 5 per cent $24.00; 6 per cent $25.00; 7 per cent $26.00; 8 per cent $27.00; 9 per cent $28.00; 10 per cent $30.00; 11 per cent $32.00; 12 per cent $34.00; 13 per cent $36.00; and 14 per cent $38.00.

Bessemer ferrosilicon, Jackson county, Ohio, furnace, 10 per cent $32.00; 11 per cent $34.00; 12 per cent $36.00; 13 per cent $38.00; and 14 per cent $40.00; 15 per cent $42.50; 16 per cent $45.00; 17 per cent $47.50

Buffalo, Nov. 22.—Withdrawal of a price fractionally under $17, formerly quoted in eastern markets by a Buffalo producer, is reported, leaving all makers here firmly on a $17 base for foundry and $17.00 to $17.50 for malleable, with the latter price more generally quoted. Buffalo furnaces have completed their barge canal shipments of iron to New York and Long Island sound points, thus also eliminating another source of low priced iron. New inquiry is less than 1000 tons. Sales are correspondingly small but steel works, using more iron in their plants, are reducing offerings of merchant tonnage.

Cleveland, Nov. 22.—Blast furnace interests with headquarters at Cleveland have booked 25,000 tons of pig iron in the past week, or 10,000 tons over the preceding week. One interest took over half this tonnage, most of it for first quarter delivery. Fresh inquiry for first quarter totals 10,000 tons. The Cincinnati-Indianapolis territory is more active than northern Ohio, and competition correspondingly keener. Some automotive foundries are expected to swing into real production the middle of December, and demand for prompt shipment may be more insistent. Shipments by all makers are heavier than last month. A steel foundry is releasing about 1000 tons of basic. The outlook generally is brighter. No. 2 foundry and malleable are $18, base, furnace, for local delivery. For shipment in outside territory the base of lake furnaces is about $1 less.

Chicago, Nov. 22.— Quiet buying of northern pig iron for nearby and first quarter shipment continues at a steady rate. Several additional large users have closed for January-February and first quarter iron. Practically no open inquiries are being issued. Several offers of 50 cents and $1 a ton under the base price of $18.50, Chicago furnace, are being made for boat iron to be delivered this season. At least one sales is reported at a price that figures $1 below the base price. It is reported that another cargo of boat iron from an eastern furnace is to arrive before the close of lake navigation. Small lots of southern iron have been

(*Concluded on Page* 1327)

Coke

Interest in Market Wanes but Production Has Been Stepped Down—Prices Unchanged

BLAST furnaces are showing little interest in their coke requirements, both for this quarter and the next. Connellsville makers claim present $6 wage scale at ovens requires market of $3 to $3.25 instead of present $2.75. Heating coke demand is suffering in all districts from unseasonable weather. Eastern users are not inclined to build up winter stocks.

Pittsbugh, Nov. 22.—Beehive coke stays in the groove of the past few weeks. Blast furnace interests is negligible. Occasional small lots are disposed of to non-metallurgical consumers. Production is well down to contract obligations. Standard furnace coke is unchanged at $2.75, minimum. Neither coke consumers nor producers are ready to talk first quarter business. Makers on a $6 wage scale say they must have $3 to $3.25. No further talk is heard concerning wage reduction. Heating coke demand fluctuates, with some activity the past week due to colder weather, at $2.50 to $2.65. Isolated cases have been noted where foundry has been quoted at $4.50 to $4.75 for first half but none is closed. Spot standard foundry coke is selling at $3.75 to $4.75 with premium brands commanding $5.10.

Production of coke in the Connellsville region for the week ended Nov. 12 was 44,120 tons, against 45,680 tons the preceding week, according to *The Connellsville Courier.*

New York, Nov. 22.—Demand for coke continues to lag. Spot beehive foundry continues $4 to $4.50, Connellsville, with higher obtained for premium brands. Foundrymen show little interest in stocks for winter. Contract specifications are slow. By-product foundry coke continues unchanged at $8.75, ovens, equivalent to $9.59 to $10.77, delivered at Newark and other Northern New Jersey consuming points.

Detroit, Nov. 22.—Buying of foundry coke is less spasmodic than at this time last month, although demand is not heavy. The price remains steady at $9 per ton, ovens, and current buying is largely on a hand-to-mouth basis. A number of consumers have present requirements satisfied and are out of the market.

Boston, Nov. 22.—Books for first half of 1928 coke business will be opened Nov. 25.

Cincinnati, Nov. 22.—Foundry coke demand has slumped. Domestic coke sales, especially of by-product, have declined due to unseasonable weather.

St. Louis, Nov. 22.—Colder weather has stimulated demand for domestic coke. Demand for metallurgical continues to lag under in influence of slack conditions in the iron and steel industry. Users are apparently well provided for with actual stocks or contracts, and new purchasing is at a minimum. There is a disposition on the part of melters to use up reserves. Prices are unchanged.

Birmingham, Ala., Nov. 22.—The lower price coke has brought little activity in buying. Domestic consumption shows slight improvement. By-product coke works are practically going to capacity. It was anticipated that at $5 there would have been much buying of foundry.

Coke Prices

Beehive Ovens

Prices per net ton

Connellsville furnace	$2.75 to 3.00
Connellsville foundry	3.75 to 4.00
New River foundry	7.00 to 8.00
New River furnace	6.00
Wise county furnace	4.25 to 5.50
Wise county foundry	4.00 to 5.00
Alabama foundry	5.50

By-Product

Foundry, Newark, N. J.; del.	9.50 to 10.77
Foundry, Chicago, ovens	9.00
Foundry, New England, del.	12.00
Foundry, St. Louis	9.75
Foundry, Birmingham	5.00 to 5.50
Foundry, Indianapolis, del.	9.75
Foundry, Ashland, Ky.	7.50
Foundry, Portsmouth, O.	7.50
Foundry, Detroit, ovens	9.00
Foundry, Buffalo, ovens	9.00

Ferroalloys

Interest in 1928 Prices Grows—Spot Market Unchanged

Pittsburgh, Nov. 22.—Users of ferroalloys are commencing to show more interest in forward needs, putting out both informal and formal inquiries, and wonder what will be done in the way of price. Quotation announcements are expected within the next week or two on 50 per cent ferrosilicon, ferromanganese, etc. Specifications have kept up fairly active in the face of reduced operating schedules, so that apparently ferroalloy consumption has expanded greatly in the past year and stocks, instead of being abnormal, are subnormal. Spot market prices are unchanged, with $90, Atlantic seaboard base, quoted on ferromanganese, and $85, freight allowed, on 50 per cent ferrosilicon. Some additional contracts on spiegeleisen have been booked, 16 to 19 per cent grade selling at $30 to $32.

Chicago, Nov. 22.—Sellers report comparatively little interest on the part of buyers in 1928 ferrosilicon and ferromanganese contracting. Sales of spiegeleisen are light and consist largely of carlot and several-carlot orders. The price of $30, eastern furnace, for the 19 to 21 per cent material, is being done more frequently.

New York, Nov. 22.—Ferrotungsten is stronger at 92.00c to 95.00c a pound contained, but other special alloys are unchanged. Contract prices for next year probably will be announced soon. Strength in tungsten is due to the ore situation, as wolframite stocks have been cut to an unusually low point with sales picking up recently after an unusually long quiet spell. No ore remains at $10 and it now is strong at $10.25 a short ton unit duty paid. Scheelite is firm at $10.50.

Acquire Cheney-Bigelow Wire Works

Springfield, Mass., Nov. 22.—The Cheney-Bigelow Wire Works, one of the oldest in the country, has been taken over by Bruce Pirnie and associates. Mr. Pirnie has been elected chairman of the board and Leroy E. Bartlett, who started with the company as office boy 30 years ago, president. Net assets of the company, founded in 1842 by the late Cheney Bigelow, exceed $1,200,000.

Norton Co. Honors 'Gold Medal' Men

Eighteen employes of the Norton Co., Worcester, Mass., were added to the roll of "gold medal men" at the annual banquet tendered veteran employes by the company. All have been with the company over 25 years. Addresses were made by President Charles L. Allen and Secretary George N. Jeppson and the medals were presented by Treasurer Aldus C. Higgins. About 125 veteran employes were guests, including several who have been with the company 42 years.

The Columbia Steel & Tube Co., New York, of which Charles Levine is head, has established an office at 1621 Oliver building, Pittsburgh.

Ferroalloy Prices

Ferromanganese, 78 to 82 per cent, tidewater, duty paid	$90.00
Ferromanganese, del., Pittsburgh	94.79
Spiegeleisen, 19 to 21 per cent domestic furnace	30.00 to 32.00
Ferrosilicon, 50 per cent freight allowed	85.00 to 87.50
Ferrochrome, 66-70 chromium, 4-6 carbon, cts. per lb. con., del.	11.50
Ferrotungsten stand. lb. cont.	92.00 to 95.00
Ferrovanadium, 30-40 per cent, per lb, estimated on analysis.	3.15 to 3.60
Ferro-carbon-titanium carload, producers plant, net ton	200.00
Ferrophosphorus, per ton, carload, 17 to 19 per cent, Rockdale, Tenn., basis (18%)	91.00
Ferrophosphorus, electrolytic, per ton, carload, 23-25% f.o.b. Anniston, Ala., (24 per cent)	122.50

Plates

Most Markets Experience Moderate Stimulus—Tank Work Is Enlivening at Chicago

AS USERS of plates find the mills standing firmly on 1.80c, Pittsburgh, and 1.90c, Chicago, efforts are made to obtain extensions of lower-priced fourth-quarter contracts. Thus far the mills have refused. About 7000 tons of tankage was placed at Chicago. New Jersey pipe lines are more active. Makers in the Pittsburgh district are operating 50 to 60 per cent.

PLATE PRICES, PAGE 1312

New York, Nov. 22.—New bids will be asked on the 60-inch pipe line, first of four sections from Belleville reservoir to Newark and Elizabeth, N. J. The unit now under consideration involves about 3000 tons of steel plates, and each of the rest will run approximately the same. O'Gara Construction Co., Newark, was low on the previous opening on the unit now under consideration. It is thought rejection of previous bids was due to the fact electric welding is not desired and the project ultimately will go riveted, lockbar or hammer-welded construction. Bids are expected to be taken shortly after Jan. 1 on 30,000 tons of steel plate pipe, for the New Jersey water supply commission; this will involve 16 miles of 74-inch twin pipe lines from Wanaque reservoir to Great Notch tunnel at Little Falls, N. J., and four miles of 72-inch pipe from the Great Notch tunnel to Belleville reservoir.

All makers now are on the basis of 1.80c, base, Pittsburgh, minimum on all new business. Much tonnage to be shipped the rest of this year will be billed at 1.75c. Many consumers have inquired about first quarter requirements but no actual commitments are reported. It is estimated eastern plate mills are operating at 30 to 50 per cent.

Pittsburgh, Nov. 22.—Numerous small orders serve to maintain plate mill operations at about the same level this month as last, or at 50 to 60 per cent. On present quarterly arrangements 1.75c is the prevailing figure. In the spot market, however, 1.80c is quoted. Contracts for first quarter are not yet being written, and some customers have tried to augment tonnages due them at 1.75c, but producers balk.

Detroit, Nov. 22.—While automotive consumption of plates is on the decline, demand shows little change compared with last month. The outlook is for continuation of present business the rest of November. The recent advance to $1.80c, Pittsburgh, has had little effect on local demand. Small users are paying slightly higher. Jobbers stocks continue low.

Cleveland, Nov. 22.—Plate sales appear to have been stimulated considerably by the recent rise to 1.80c, Pittsburgh. An order for 1000 tons for a Chicago shipyard has been entered here. A shipyard at Toledo, O., is placing 800 tons for a car ferry. Many plate users are protecting themselves on their needs for the rest of the year and some into the first quarter.

Chicago, Nov. 22.—An oil tank builder placed about 7000 tons of tank plates with a Chicago mill for West Texas oil fields in addition to a similar tonnage placed a week ago. Manufacturing demand for plates in the Chicago district is keeping up to a good rate, although individual orders are small-lot. Several thousand tons were placed during the week. Inquiry, stimulated to some extent by the recent advance in prices, is gaining and some buyers are asking first quarter prices. Mills are naming 1.90c on new business, although there are practically no bookings for first quarter. Tank plates in the southwest, which had been shaded, are reported firmer.

Up to 50,000 tons of plates may be required for a large western pipe line which is being actively figured.

Philadelphia, Nov. 22.—Although plate consumers in most cases are protected to the end of the year at 1.75c, Pittsburgh, the market now generally is 1.80c, Pittsburgh. Demand is somewhat better.

CONTRACTS PLACED

1000 tons, 8400-feet of lap welded pipe for Vancouver, B. C., to Leith & Murray, for English materials.

CONTRACTS PENDING

New Inquiry and Developments on Projects Previously Reported

620 tons, 18 to 24-inch welded pipe, Ventura, Calif.; bids Dec. 5. Alternate bids on cast iron pipe being taken.

600 to 1000 tons, 36-inch riveted pipe-line for reconstruction of Verde pipe line, Phoenix, Ariz., went reinforced concrete pipe.

Semifinished

Specifications Showing Increase Over October Rate—Prices Appear Firm—Skelp Not Wanted

IMPROVEMENT noted in market at Pittsburgh is ascribed to the activity of strip steel makers. A tonnage of carbon billets has been closed at $33. Little new business has come out in sheet bars but $34 appears to be well maintained. Wheel and tubular skelp specified out recently is against low-priced contracts. Wire rods continue irregular.

SEMIFINISHED STEEL PRICES, PAGE 1312

Pittsburgh, Nov. 22.—Semifinished steel specifications this month have mounted considerably over October, due primarily to improvement in strip steel manufacturers. Some stripmakers have furnished specifications for as many as three consecutive days and then have skipped a day, and another active period has then ensued. The price of billets and slabs again has been demonstrated to be no less than $33. Witherow Steel Co. has purchased a large tonnage of carbon billets at the $33, base, figure and likewise has closed on a tonnage of alloy billets. Some attractive specifications have been received against $39 forging billet contracts. Nothing has been done in sheet bars, but $34 is understood to be maintained. Skelp is nominal at 1.80c, no new inquiries being out. Some specifications have come out on both wheel and tubular skelp the past 10 days, but this tonnage is applied against lower priced contracts. Wire rod makers here claim not to have gone as low as $40, but they had to meet a $41 price.

Philadelphia, Nov. 22.—Wire rods continue $40 to $42, Pittsburgh. Contract buying has practically disappeared. Billet sales include only scattered tonnages. Prices are unchanged.

Pig Iron Rate Is Upheld

Washington, Nov. 22.—The rate on pig iron, in carloads, from Jackson, O., to Pontiac, Mich., for the period subsequent to April 29, 1925, was not found unreasonable or otherwise unlawful in a proposed report prepared for the interstate commerce commission by Alfred G. Hagerty, attorney-examiner of the commission. The proposed decision is in the case of the Wilson Foundry & Machine Co. against the Ann Arbor railroad.

Iron and Steel Scrap Prices

Corrected to Tuesday noon. Gross Tons Delivered to Consumers

Steel Works Scrap

HEAVY MELTING STEEL

Birmingham	10.50 to 10.75
Boston (dealers)	8.50 to 9.00
Buffalo, No. 1	14.25 to 14.50
Buffalo, No. 2	12.50 to 13.00
Chicago	11.50 to 12.00
Cincinnati (dealers)	10.75 to 11.25
Cleveland, No. 1	13.25 t o13.75
Cleveland, No. 2	12.75 to 13.25
Detroit, No. 1	11.25 to 11.75
Eastern Pennsylvania	13.50 to 14.00
Eastern Pennsylvania, No. 2	11.00 to 11.50
Bethlehem delivery	13.50 to 14.00
New York (dealers) (railroad)	10.00 to 10.85
New York (dealers) (yard)	6.75 to 7.00
Pittsburgh, No. 1	14.25 to 14.75
St. Louis	10.75 to 11.00
Valleys, No. 1	14.50 to 15.00

COMPRESSED SHEETS

Buffalo	11.50 to 12.00
Chicago	10.00 to 10.50
Cleveland	12.25 to 12.50
Detroit	9.75 to 10.25
Pittsburgh	13.50 to 14.00
Valleys	13.50 to 14.00

BUNDLED SHEETS

Buffalo	8.75 to 9.25
Cincinnati (dealers)	9.50 to 10.00
Cleveland	11.00 to 11.25
Eastern Pennsylvania	10.50 to 11.00
Pittsburgh	12.50 to 13.00
St. Louis	7.75 to 8.25

SHEET CLIPPINGS, LOOSE

Chicago	8.25 to 8.75
Cincinnati	8.50 to 9.00
Detroit	7.50 to 8.00
St. Louis	7.50 to 8.00

STEEL RAILS, SHORT

Birmingham	11.50 to 12.00
Buffalo	13.50 to 14.00
Chicago	14.25 to 14.75
Cincinnati (dealers)	16.00 to 16.50
Detroit	11.00 to 11.50
St. Louis	15.50 to 16.00

STOVE PLATE

Birmingham	13.00 to 14.00
Boston (consumers)	12.50 to 13.00
Buffalo	12.75 to 13.25
Chicago (net)	12.00 to 12.50
Cincinnati (dealers) net	9.25 to 9.75
Cleveland	12.00 to 12.50
Detroit (net tons)	10.75 to 11.25
Eastern Pennsylvania	12.50 to 13.00
New York (dealers) (mill)	8.25 to 8.50
Pittsburgh	12.00 to 12.50
St. Louis	13.00 to 13.50

LOW PHOSPHORUS

Buffalo, billet and bloom crops	16.50 to 17.00
Cincinnati (dealers)	13.00 to 13.50
Eastern Pennsylvania	17.50 to 18.50
Pitts. billet and bloom crops	18.50 to 19.00
Cleveland, billet and bloom crops	17.00 to 17.50

SHOVELING STEEL

Chicago	11.50 to 12.00
Pittsburgh	11.00 to 11.50
St. Louis	10.75 to 11.00

KNUCKLES, COUPLERS, SPRINGS

Chicago	13.25 to 13.75
Eastern Pennsylvania	16.00 to 16.50
Pittsburgh	16.00 to 16.50
St. Louis	12.00 to 12.50

FROGS, SWITCHES, GUARDS

Chicago	12.75 to 13.25
St. Louis	12.00 to 12.50

ANGLE BARS—STEEL

Buffalo	15.25 to 15.75
Chicago	13.00 to 13.50
St. Louis	11.00 to 11.50

Iron Mill Scrap

RAILROAD WROUGHT

Birmingham	11.50 to 12.00
Boston (dealers)	10.50 to 11.00
Buffalo, No. 1	12.25 to 12.75
Buffalo, No. 2	14.25 to 14.75
Chicago, No. 1	11.25 to 11.75
Chicago, No. 2	11.50 to 12.00
Cincinnati, No. 1 (dealers)	11.00 to 11.50
Cleveland, No. 1	11.50 to 12.00
Eastern Pennsylvania	15.50 to 16.00
New York, No. 1 (dealers)	12.50 to 13.00
Pittsburgh, No. 1	11.00 to 11.50
Pittsburgh, No. 2	14.25 to 14.75
St. Louis, No. 1	10.00 to 10.50
St. Louis, No. 2	10.75 to 11.00

WROUGHT PIPE

Boston (dealers)	8.00 to 8.50
Eastern Pennsylvania	12.50 to 13.00
Buffalo	12.00 to 12.50
New York (dealers)	8.25 to 8.75

YARD WROUGHT

Boston	8.50 to 9.00
Eastern Pennsylvania	15.00 to 15.50

BUSHELING

Buffalo	12.00 to 12.50
Chicago, No. 1	10.00 to 10.50
Chicago, No. 2	8.50 to 9.00
Cincinnati, No. 1 (dealers)	10.50 to 11.00
Cincinnati, No. 2	7.00 to 7.50
Pittsburgh, No. 1	12.00 to 12.50
St. Louis, No. 1	9.75 to 10.25

MACHINE SHOP TURNINGS

Birmingham	8.00 to 9.00
Boston	6.00 to 6.50
Buffalo	9.00 to 9.50
Chicago	7.50 to 8.00
Cincinnati (dealers)	8.00 to 8.50
Cleveland	9.00 to 9.25
Detroit	7.00 to 7.50
Eastern Pennsylvania	10.50 to 11.00
New York (dealers)	6.50 to 7.00
Pittsburgh	11.00 to 11.50
St. Louis	6.25 to 6.75

CAST IRON BORINGS

Birmingham (chemical)	13.00 to 13.50
Birmingham plain	8.00 to 9.00
Boston, (chemical)	10.75
Boston (dealers)	6.50 to 7.50
Buffalo	10.00 to 10.50
Chicago	9.50 to 10.00
Cincinnati (dealers)	8.50 to 9.00
Cleveland	10.25 to 10.75
Detroit	8.50 to 9.00
Eastern Pennsylvania	11.25 to 11.50
Eastern Pennsylvania (chem.)	15.00 to 16.00
New York (dealers)	7.25
Pittsburgh	11.00 to 11.50
St. Louis	8.75 to 9.00
Valleys	13.50

MIXED BORINGS AND TURNINGS

For blast furnace use

Boston (dealers)	5.50 to 6.00
Buffalo	10.00 to 10.50
Cincinnati (dealers)	8.50 to 9.00
Cleveland	10.25 to 10.75
Detroit	8.50 to 9.00
Eastern Pennsylvania	10.00 to 10.50
New York (dealers)	7.00 to 7.35
Pittsburgh	11.00 to 11.50

PIPES AND FLUES

Chicago (net)	7.50 to 8.00
Cincinnati (dealers)	7.50 to 8.00
St. Louis	9.25 to 9.75

RAILROAD GRATE BARS

Buffalo	10.50 to 11.00
Chicago (net)	10.50 to 11.00
Cleveland	12.00 to 12.50
Eastern Pennsylvania	12.50 to 13.00
New York (dealers)	8.75 to 9.25
St. Louis	11.00 to 11.50

FORGE FLASHINGS

Boston (dealers)	6.00 to 6.50
Buffalo	11.00 to 11.50
Chicago	9.00 to 9.50
Cleveland (over 10 in.)	12.00 to 12.50
Detroit	9.25 to 9.75
Pittsburgh	13.00 to 13.50

FORGE SCRAP

Boston (dealers)	6.00 to 6.50
Chicago	14.00 to 14.50
Eastern Pennsylvania	10.50 to 11.00

ARCH BARS AND TRANSOMS

Chicago (net)	17.50 to 18.00
St. Louis	18.50 to 19.00

Iron and Steel Works Scrap

AXLE TURNINGS

Boston (dealers)	8.00 to 8.50
Buffalo	13.00 to 13.50
Chicago	10.00 to 10.50
Cleveland	12.00 to 12.25
Eastern Pennsylvania	12.50 to 13.00
Pittsburgh	13.00 to 13.50
St. Louis	8.50 to 9.00

STEEL CAR AXLES

Birmingham	16.00 to 17.00
Boston (shipping point)	15.50 to 16.00
Buffalo	14.75 to 15.25
Chicago	16.80 to 17.35
Cleveland	16.00 to 16.50
Eastern Pennsylvania	21.00 to 22.00
Pittsburgh	18.00 to 18.50
St. Louis	18.25 to 18.75

SHAFTING

Boston (shipping point)	14.00 to 14.50
Chicago	16.80 to 17.35
Eastern Pennsylvania	17.50 to 18.00
New York (dealers)	14.00 to 14.50
St. Louis	16.00 to 16.50

Iron Foundry Scrap

CAR WHEELS

Birmingham, iron	14.00 to 15.00
Boston (consumers)	17.00 to 17.50
Buffalo, iron	13.75 to 14.25
Buffalo, steel	15.25 to 15.75
Chicago, iron	13.00 to 13.50
Chicago, rolled steel	14.00 to 14.50
Cincinnati	12.75 to 13.25
Eastern Pennsylvania	16.00 to 16.50
New York iron (dealers)	12.00
Pittsburgh, iron	14.00 to 14.50
Pittsburgh, steel	16.00 to 16.50
St. Louis, iron	12.00 to 12.50
St. Louis, steel	12.25 to 12.75

NO. 1 CAST SCRAP

Birmingham, cupola	14.00 to 14.50
Boston	15.50 to 16.00
Buffalo	14.00 to 14.50
Chicago, No. 1 machinery	15.70 to 16.25
Chicago, No. 1 railroad	14.00 to 14.55
Chicago No. 1 agricultural	14.00 to 14.55
Cincinnati No. 1 machinery cupola (net tons dealers)	14.25 to 14.75
Cleveland, cupola	16.50 to 17.00
Detroit (net tons)	12.50 to 13.00
Eastern Pennsylvania (cupola)	16.50 to 17.00
New York, cupola (dealers)	13.50 to 14.00
Pittsburgh, cupola	14.50 to 15.00
San Francisco, delivered	20.00 to 21.00
Seattle	16.00
St. Louis, railroad	13.25 to 13.75
St. Louis, agricultural	13.25 to 13.75
St. Louis, machinery	13.25 to 13.75
Valleys	16.50 to 17.00

HEAVY CAST

Boston	15.00 to 15.50
Buffalo (breakable)	11.50 to 12.00
Cleveland	12.50 to 12.75
Detroit (automobile) (net tons)	18.50 to 19.50
Eastern Pennsylvania	15.50 to 16.00
New York (dealers)	11.75 to 12.00
Pittsburgh	13.50 to 13.75

MALLEABLE

Boston, railroad	14.50 to 15.00
Buffalo	13.50 to 14.00
Chicago, agricultural	11.75 to 12.25
Chicago, railroad	12.50 to 13.00
Cincinnati, railroad (dealers)	12.00 to 12.50
Cincinnati, agricultural (dealers)	11.00 to 11.50
Cleveland, agricultural	15.00 to 15.50
Cleveland, railroad	15.50 to 16.00
Detroit, auto	13.50 to 14.00
Pittsburgh, railroad	14.00 to 14.50
St. Louis, agricultural	10.75 to 11.25
St. Louis, railroad	11.00 to 11.50

Miscellaneous Scrap

RAILS FOR ROLLING

5 feet and over

Birmingham	14.00 to 14.50
Boston (dealers)	10.50 to 11.00
Buffalo	14.25 to 14.75
Chicago	13.50 to 14.00
Eastern Pennsylvania	16.00
New York	11.00 to 12.00
Pittsburgh district	16.50 to 17.00
St. Louis	13.25 to 13.75

LOCOMOTIVE TIRES

Chicago, No. 1	14.00 to 14.50
Chicago, cut	14.00 to 14.50
St. Louis, No. 1	13.00 to 13.50

LOW PHOSPHORUS PUNCHINGS

Chicago	13.00 to 13.50
Pittsburgh	16.25 to 16.75

Scrap

Larger Activity Shown in Some Centers and Prices Are Holding Better

WHILE better sentiment in iron and steel scrap is not general or strongly marked, some signs indicate that consumers are looking to the future and that underlying conditions are stronger. Offers by consumers at former levels do not bring purchases and an upward trend has become noticeable. Buying remains in relatively small volume.

Chicago, Nov. 22.—Dealer sentiment in iron and steel scrap is slightly stronger, due in part to recent advance in finished steel and reports that gray iron foundry operations show signs of increase. Heavy melting steel continues at $11.50 to $12. Several dealers have had to pay $12 and slightly over for short-range requirements to fill urgent small orders. A steelworks consumer has offered $11.50 and refused to buy at $11.75. Malleable scrap is weak. Both railroad and agricultural malleable have dropped off 50 cents. Miscellaneous railroad scrap and rerolling rails have dropped 25 cents each.

Boston, Nov. 22.—The slight improvement in scrap buying noted a week ago has not held. Business is confined to carlots of miscellaneous material, and such orders are few. Heavy melting steel, yard steel, steel turnings, mixed borings and turnings and skeleton are most active. A Massachusetts consumer heretofore in the market for stove plate at $10.50 to $11 a ton delivered has withdrawn. Some local brokers heretofore paying $5.65 a ton for long bundled skeleton on cars, shipping point, cannot do better than $5.10 today.

New York, Nov. 22.—Scrap dealers' buying prices are unchanged, with consuming demand restricted. A Phoenixville, Pa., consumer is reported to be closing 2000 to 3000 tons of turnings, yard steel and stove plate, paying $11, $11.50 and $12.50, delivered, respectively. Recently this concern was offering $10.50, delivered, for turnings, but offered later to pay $11 on at least a fair-sized tonnage, provided it could obtain similar quantities of yard steel and stove plate at specified figures.

Philadelphia, Nov. 22.—Several lots of No. 1 heavy melting steel, each around 1500 to 2000 tons, have been sold recently. They all brought $14, delivered. This generally now seems to be the price for this grade of scrap and nothing has been heard as going at less. About 1000 tons of heavy breakable cast has moved at $16, delivered, and round tonnages of stove plate and machine shop turnings at unchanged prices.

Pittsburgh, Nov. 22.—The first definite trend upward in several weeks is seen in the scrap market. While one buyer has been able to close on several thousand tons of heavy melting steel at $14.25, another recently paid $14.75. One interest is credited with paying $15 for desirable scrap. Due to general scarcity, a strong buying movement would send heavy melting steel to a $15 minimum. Steel foundries are seeking more specialities, and are offering $16 to $16.25.

Buffalo, Nov. 22.—Larger shipments of heavy melting steel are being made on contracts but new business is coming out slowly. Prices continue low with dealers governing their purchases accordingly. A softer tone is noted in malleable and some other specialties for which there is little demand.

Cleveland, Nov. 22.—The lead of a large steelmaker in closing on a tonnage of heavy melting steel for first quarter delivery at $14 for No. 1 and $13.50 for No. 2 has not been followed by other melters. Melters are taking in only sufficient scrap to maintain their present moderate rates of operation. Pending receipt of heavier automotive orders, valley mills will probably continue to hold up or regulate shipments. Melting steel is quotable at $13.25 to $13.75. Prices generally are nominal.

Detroit, Nov. 22.—Weakness features iron and steel scrap in this district. New business is in small tonnages. Rejections are becoming more common and many consumers are holding up orders. In spite of material curtailment of production so far this month, as a result of decreased automotive activities, there is an ample supply of all grades except heavy auto cast, which is scarce and for which there is a firm market.

Cincinnati, Nov. 22.—Iron and steel scrap is quiet with movement scarcely perceptible and with prices still heavy and inclining downward. One fair tonnage has been reported at Portsmouth, O., where an order to local dealers caused some demand for material from outside.

St. Louis, Nov. 22.—Iron and steel scrap is still in one of the longest periods of depression and declining prices ever experienced. Sentiment and actual conditions have undergone no change, except that dealers are cheerful to the extent of feeling that any change must be upward.

Birmingham, Ala., Nov. 22.—No change is noted in iron and steel scrap. Heavy melting steel is holding at $10.75 per ton, delivered at consumers' yards. A large percentage of the open-hearth furnace capacity of the district is in operation.

Sheets

Sentiment Improves Faster Than Sales—Prices Remain Unsteady —Automotive Buying to Grow

INDEPENDENT sheet mills in the Mahoning valley view the situation more cheerfully. Makers at Pittsburgh say they are turning down proffers of tonnage for first quarter delivery at today's minimums. The market at New York has eased off. Unsteadiness still describes the Detroit situation. Prices have suffered in the press for business at Cleveland. Orders at Chicago are light.

SHEET PRICES, PAGE 1312

Pittsburgh, Nov. 22.—Some sheetmakers claim to be turning down first quarter business at current prices. Buyers apparently believe it would be good business to close at present minimums and hence have shown anxiety to place business. Books have not been opened for first quarter but attractive orders for prompt shipment are being taken and these sometimes involve 750 tons to 1000 tons. The majority of prompt shipment orders, however, are 100, 200 or 300 tons. The keenest competition exists in the East. The middle West condition is more stable but still highly competitive. Farm implement interests continue to buy for delivery for the rest of the year. Stove and range interests, too, are important purchasers, although individual orders are small. Building construction interests continue to buy metal lathe and other grades, electrical sheet demand still keeps up, and considerable tonnage is going to manufacturers of electric refrigerators. Orders for car building and repair work are negligible and the automotive sheet buying is disappointing. This latter, however, is expected to pick up in December. In black sheets, some small independent manufacturers have again gone as low as 2.75c. In galvanized, some 3.60c prices have appeared against 3.65c, last week's minimum. Blue annealed is still subjected to competition both from strip and plate mills. So far as can be learned, full finished sheet

makers have refused to recede from 4.15c. Sheet mill operations continue to drop a trifle, one large interest being on a 61 per cent basis this past week, against a 63 per cent level the week before. The average for the territory continues around 65 per cent.

New York, Nov. 22.—Prices on sheets have eased off somewhat to the level recently touched in making concession on attractive tonnages. The market is 2.70 to 2.75c, base, Pittsburgh, on black sheets, 3.65c on galvanized and 2.10 to 2.15c on blue annealed. On blue annealed, however, 2.10c now is more frequent than 2.15c. Demand is better; consumption unmistakably has improved. The lower prices are bringing out fair tonnages from consumers who had been holding off for a break such as the present.

Detroit, Nov. 22.—Sheet demand continues backward as a result of curtailed activities in the motor industry. The market as a whole is somewhat unsteady and little improvement is looked for the rest of the month. Some motor car manufacturers have come out with inquiries for December requirements. Blue annealed sheets are fairly stable at 2.10c to 2.15c, Pittsburgh, while autobody are 4.15c. On galvanized 3.65c is quoted in some instances.

Chicago, Nov. 22.—Sheet business fails to improve. It is difficult for producers to schedule business more than a week ahead of operations. A general tendency is seen on the part of users to reduce inventories to the minimum. This is particularly true of jobbers. Producers are hesitant about booking first quarter business at present prices. These prices are holding in the immediate Chicago district but are being shaded $1 a ton in competitive freight rate territory. Chicago delivered prices are 2.95c to 3.05c for No. 24 black, 3.85c to 3.95c for No. 24 galvanized, and 2.30c for No. 10 blue annealed. Mill prices are $1 a ton lower. Operations are about 65 to 70 per cent.

Cincinnati, Nov. 22.—Blue annealed sheets are moving fairly well at 2.10c, Pittsburgh. Full finished hold at 4.15c. Little increase in demand is looked for until after the turn of the year.

Youngstown, O., Nov. 22.—More cheerful sentiment is discernible among smaller independent sheet mills despite the slower rates of mill operations at 51 per cent against 57 per cent last week. The improved sentiment is based upon knowledge of actual production schedules among Michigan and northern Ohio automotive interests to be put into effect Dec. 1 and added to successively by months until nearly normal is attained late in February or mid-March. Upon these production schedules are being erected schedules for material purchases, from which the local mills ought to begin to receive tangible orders within ten days or two weeks.

Quotations have not changed on the small volume of business now coming in. Common black and blue annealed sheets make up the bulk of such tonnages, each rather small, but with buyers insistent upon deliveries being made promptly.

Cleveland, Nov. 22.—A slight improvement in general manufacturing demand for steel sheets was reported by some mills in the past week. Automotive buying still is slack, parts makers and other stampers taking small lots. Autobody sheets are holding at 4.15c, Pittsburgh. Black sheets seem to have steadied with the leading producer asking 2.80c, Pittsburgh. Quotations under that level have not appeared in the past few days. Blue annealed continues from 2.00c to 2.10c, with lower quotations resulting from continuous mill and plate mill competition. Galvanized is weak at 3.65c, Pittsburgh.

Philadelphia, Nov. 22.—Sheet demand continues fair, with eastern mill operations at 65 per cent. Blue annealed sheets are 2.10c to 2.15c, Pittsburgh, blue annealed 2.75c to 2.80c, and galvanized 3.65c to 3.75c.

Tin Plate

Anticipated Needs Maintain Fair Tin Plate Operations

TIN PLATE PRICES, PAGE 1312

Pittsburgh, Nov. 22.—Price announcements on tin plate for first half will probably not come out until after Thanksgiving. In the meantime, business for this year is practically finished. A few users have anticipated their needs on standard sized cans for early next year and this enables some mills to continue on a 60 to 65 per cent basis. While the trade generally is anxious to have $5.50 reaffirmed as next year's selling price, cut prices still seem to be available from time to time down to $5.30, the present 58-cent per ton pig tin price having some influence.

Pipe

Projected Gas Lines Involve 200,000 to 300,000 Tons—Heavy Cast Business Still Pending

GAS lines in process of negotiation in the Southwest will require about 200,000 tons with a 50,000-ton oil line also in prospect. Miscellaneous business is fair but mill operations still hang around 50 per cent of capacity. Cast iron pipe in the East is in heavy demand, but no action has been taken against inquiries. A New York tunnel will take 27,000 tons of cast segments.

PIPE PRICES, PAGE 1312 AND 1346

Pittsburgh, Nov. 22.—Estimates of tonnage involved in projected gas lines, on which informal and formal inquiries have been issued, run from 200,000 to 300,000 tons. One of these, a 12-inch line 102 miles long from Shelby, Mont., to Great Falls, Mont., for the Montana Cities Gas Co., will take 12,500 tons. Transcontinental Oil Co., through its subsidiary, the United Producers Pipe Line Co., has not yet placed the 50,000 tons of 10-inch and may have the help of the Ohio Oil Co. in laying the line. Another Texas line is being planned and one from Louisiana to St. Louis as well as one from Louisiana to Kansas City. These all are gas lines, except the Transcontinental Oil Co.'s proposed purchase. Miscellaneous pipe business is holding up well, numerous jobbers contributing many orders. Jobbers' preferential discounts still apply, some receiving two instead of one extra 5 per cent. This condition is more accentuated in the East than in the Middle West or Far West. Mill operations continue to average between 50 and 60 per cent.

Boston, Nov. 22.—The market for cast iron pipe at the moment is dull in inquiries and prospects are not bright. One of the leading gas companies in the market for first half requirements that will total 4000 tons and it is understood a tentative agreement has been reached. Private business continues to measure up satisfactorily. Foundries are reported not so anxious to make concessions as a fortnight ago.

Chicago, Nov. 22.—Contract business for cast iron water pipe has fallen off sharply this month, with the exception of bookings by one or two makers who obtained some fairly good individual orders. Some of the pipe makers have accumulated heavy stocks in the past month or two. Sellers are showing a desire to hold to higher prices. Chicago will ask bids Nov. 28 on 800 tons of 4 to 8-inch pipe. A fair amount of one or two carlot orders are being received. More contract business has been holding at $28 to $30, Birmingham, for 6 to 24-inch.

About one-third of the 100,000 tons of 20 and 22-inch pipe which the Colorado Interstate Gas Co. has ordered from the National Tube Co. will be rolled at the Gary plant. No. 4 lapwelded, mill will be kept busy four months on this order.

Ozark Pipe Line Co., affiliated with Roxana Petroleum Corp., is ready to start on a 10-inch line from the Pecos field in West Texas to Chicago.

Birmingham, Ala., Nov. 22.—Lettings for cast iron pressure pipe have been fairly steady the past few weeks. Quotations are reported firmer at $29 to $30 on 6-inch and over

sizes. Production is being held steady at 75 per cent. Winter activity promises to be better than estimated.

New York, Nov. 22.—A substantial tonnage of cast iron pipe is pending in this district with some delay being experienced in closing on certain of the larger proposals. One of the larger contracts calls for 3000 to 4000 tons of water pipe, mostly under 12-inch, for the community water service, the busines going to United States Cast Iron Pipe & Foundry Co. A leading inquiry calls for 10,000 tons of gas and water pipe for C. H. Geist, Philadelphia.

CONTRACTS PLACED

3000 to 4000 tons, under 12-inch, community water service in New York, to United States Cast Iron Pipe & Foundry Co.

465 tons, 4 to 16-inch pipe, Clifton, N. J., awarded through general contractor to United States Cast Iron Pipe & Foundry Co.

244 tons, 4 and 6-inch class 250 and 8-inch class 350, Burbank, Calif., 212 tons of 4 and 6-inch to Pacific States Cast Iron Pipe Co. and 32 tons of 8-inch to American Cast Iron Pipe Co.

153 tons, 4 and 6-inch class B, improvement of Campo road, San Diego, Calif., to R. H. Downer.

100 tons, Newton, Mass., to Warren Pipe & Foundry Co.

CONTRACTS PENDING

New Inquiry and Developments on Projects Previously Reported

27,000 tons, cast iron segments for tunnels under Harlem river and Newton creek, New York; bids to be asked by the local board of transportation before Jan. 1.

10,000 tons, gas and water pipe for C. H. Geist, Philadelphia.

3605 tons, 36-inch class A pipe, reconstruction of Verde pipe line, Phoenix, Ariz.; went reinforced concrete pipe.

1900 tons, 20-inch water pipe for the department of water supply, gas and electricity, New York, general contractors' bids to be opened next week.

1500 tons, water and gas pipe, inquiry being issued through J. G. White Engineering Co., 43 Exchange place, New York.

1000 tons, 4 to 12-inch Providence, R. I.; bids opened Nov. 21.

800 tons, 4 to 8-inch pipe, for Chicago; bids to be received Nov. 28.

686 to 3542 tons of 4 to 24-inch class B, Ventura, Calif.; bids Dec. 5. Alternate bids on welded pipe for the 18, 20 and 24-inch sizes.

491 tons, 4 and 8-inch class B pipe, improvement to South Main street, Santa Ana, Calif.; mids in Nov. 28.

300 tons, 4 to 42-inch pipe, principally smaller sizes, Newark, N. J.; bids in Nov. 21.

300 tons, 8-inch cast iron water pipe for Portland, Me.

Forms Steel Company

St. Louis, Nov. 22.—The National Enameling & Stamping Co. has incorporated a wholly-owned subsidiary, the Granite City Steel Co., which will own and operate the former company's steelworks at Granite City, Ill., without any change in executive or operating management

The Aluminum Co. of America, Pittsburgh, will make pistons for the new Ford car.

Bars

Consumers Seek First Quarter Tonnages but Makers Hold Back for Higher Price

ADVANCE in bar prices has brought more activity in inquiry for first quarter. Sales for that delivery at the present price are denied and a higher figure is planned by makers. Bar demand leads finished steel in the West. An increase of 10 per cent in buying is seen at Pittsburgh. Inventory is having its usual effort in delaying deliveries.

BAR PRICES, PAGE 1312

Chicago, Nov. 22.—Inquiry is being stimulated and first quarter negotiations are appearing more freely. This has been induced largely by the recent advance to a minimum of 1.90c, Chicago. Demand for bar products continues to lead finished steel, although only a shade ahead of plates, which have been active during the past two weeks. Sales of bars are reported slightly ahead of production. Bar deliveries, as in the case of all finished products, can be made promptly. A noticeable tendency is shown by buyers to keep stocks low for inventory and inquiry is largely for shipment late in December.

Mills are naming 1.90c as the minimum for soft steel bars. Bargaining for 1.85c fails to result in sales. Mills are seeking to establish 2.00c for lots under 100 tons.

Rail steel bars show no improvement although buying from agricultural sources continues to lead. Reinforcing bar shipments are steady and have increased in the past two months. Rail steel bars to the manufacturing trade are 1.80c for attractive business and 1.85c, Chicago Heights, for smaller lots. Operations are at a high rate. Bar iron is 1.85c to 1.90c.

New York, Nov. 22.—Eastern bar iron mills say that foreign competition has resulted in cutting down materially demand they formerly enjoyed out of New York. Foreign bars are bringing 1.65c to 1.80c, all charges paid. Domestic iron bars are bringing in small lots from 2.10c to 2.40c, base, delivered at consumers' door in New York. Carloads usually bring around 1.75c, base, Pittsburgh, or 2.09c, delivered New York, although in some cases carloads have sold at less than 1.70c.

Buffalo, Nov. 22.—Buffalo price on bars has been increased to a minimum of 2.065c, delivered. Steelworks production of bars is gaining as specifications continue to improve. Some steelworks have more than 80 per cent of their open hearth units in operation although the average of the district is not this high.

Pittsburgh, Nov. 22.—Merchant steel bar specifications are somewhat heavier this month than last, the recent advance having a stimulating effect. According to a number of bar makers here, the increase over the same period in October is 10 or 15 per cent. So far little has been done in the open market at 1.80c although single carloads now and then carry that figure. While the report has been circulated that some first quarter bookings have been made at 1.38c, this is denied by the largest steel companies, who are looking for a further advance to at least 1.85c for that period. Consumption apparently is increasing and except for the usual holiday and inventory lulls, mills look for good business between now and Jan. 1 and better business in the first quarter. Refined iron bar demand is spasmodic, buyers taking only small quantities. Prices start at 2.75c.

Youngstown, O., Nov. 22.—Sales of steel bars, shapes which take the bar mill card, and plates have not been more noticeably active here since the prices of these commodities were advanced by $1 a ton to 1.80c, Pittsburgh. However, some additional specifications on orders taken at 1.75c previously have come along, sufficient in total volume to enable a few more bar mills to be put on this week both with the leading interest and with independents.

Cleveland, Nov. 22.—Sales of soft steel bars have spurted the past week. Not only are many users finding their needs for the rest of this quarter growing but some are also covering into the first quarter on the current basis of 1.80c, Pittsburgh. One maker has booked a single order of 2000 tons of bars of one size for November-December delivery. Sentiment among bar users is greatly improved.

Detroit, Nov. 22.—Consumption of bars is below this time last month. The advance to 1.80c, Pittsburgh, has not increased demand as much as was anticipated, although some improvement resulted.

Dominion Books Rails

Toronto, Ont., Nov. 22.—The Dominion Iron & Steel Co., Sydney, N. S., has taken orders recently for rails for Jamaica, Chile and other destinations, in addition to Canadian orders for track material and states it has sufficient business to keep 2600 men on the payroll six months.

Rome Wire Co., Rome, N. Y., has changed its name to Rome Stockholders.

Structural Shapes

Transportation Work Pending in New York Totals 30,000 Tons—Large Projects Fewer in Other Districts—Material Prices Firmer

INCLUDING a 7500-ton subway section mentioned last week, prospective transportation work in New York aggregates 30,000 tons. In addition several other large projects are in sight although fabricators are beginning to question the market with the idea that some types of buildings are reaching the saturation point in New York. Despite an increase of building work in New York in October of over 50 per cent in value, large construction fell off 25 per cent. Chicago, Cleveland, Philadelphia, Boston, and other cities report a scarcity of large tonnages in prospect for building work.

Plain material prices are showing more strength at the newly established 1.80c, Pittsburgh, and 1.90c, Chicago, levels.

STRUCTURAL SHAPE PRICES, PAGE 1312

New York, Nov. 22.—Featuring the local structural market is proposed transportation work. Subway projects to be brought out before Jan. 1 and including a 7500-ton section noted last week as pending, will require 30,000 tons of shapes, and, incidentally, 27,000 tons of cast iron segments for tunnels under the Harlem river and Newtown creek.

Miscellaneous building construction is relatively slack, and despite the volume of work on architects' boards, some fabricators are none too optimistic over the immediate future. They believe that some lines of construction are nearing a saturation point, at least for the present, particularly lofts. They also point to what they regard as an unbalanced labor situation in the building trades and to a more conservative attitude by loan companies.

Despite the increase in building work placed in New York state and the northern New Jersey district in October, involving $168,000,000, compared with $105,000,000, in the preceding month, there was a falling off of 25 per cent in heavy construction. Plans filed in New York in October called for 35 jobs of $100,000 and over, as against 45 in the preceding month.

Plain material prices are tending upward.

Boston, Nov. 22.—The brightest spots for future tonnages in the structural market are the proposed new north station for the Boston & Maine railroad and the proposed municipal auditorium. These two projects will call for a good tonnage. Generally the situation is somewhat better than at this period of the year and various interests are becoming more optimistic than for some few weeks.

Pittsburgh, Nov. 22.—Inquiries from distant points involving structural shapes are more voluminous than those for Pittsburgh. These latter are of slim proportions just now although a number of schools, hospitals and small structures are coming up for completion before extremely cold weather. Local fabricators are interested in a 1300-ton theater job at Toledo, O. Plain material is 1.80c, and that figure was named against a block of jobs in the East offered to a large fabricator at 1.75c, involving a total of 18,000 tons. In the meantime, specifications against 1.75c contracts are coming in regularly.

Cleveland, Nov. 22.—Structural shape mills are in a better position than for months. The recent increase of plain material prices to 1.80c, Pittsburgh, has influenced a number of buyers to enter the market for coverage of December requirements. Contractors show more interest in booking their steel quicker. Fabricated quotations continue keenly competitive with small lots still predominant in the district market.

Chicago, Nov. 22.—Tonnage awards of structural steel in this district are light. Fair inquiry is appearing. Bids are being asked on about 3100 tons for river bridges in Chicago. Prospects that the Illinois legislature may be convened in special session in January to enact legislature for Chicago subways indicate that subway building in Chicago may be developed within the next year. Smaller fabricating shops have been receiving a steady amount of small business. Buying of plain material lags slightly behind bars and plates, but considerable inquiry is out for first quarter. Fabricators are seeking to keep stocks reduced for inventory. A minimum of 1.90c, Chicago, is asked for new business.

Detroit, Nov. 22.—Demand for structural steel is small and limited to small tonnage requirements. Practically no large contract has been awarded this month. Interest at present centers in the awarding of the contract for the Stott Realty building at Griswold and State streets here, taking approximately 3500 tons. No other tonnages of material size are in immediate prospect.

Awards Compared

	Tons
Awards this week	12,498
Awards last week	28,192
Awards two weeks ago	34,364
Awards this week in 1926	36,405
Average weekly awards, Oct	41,640
Average weekly awards, 1927	36,029
Total awards to date, 1926	1,320,528
Total awards to date, 1927	1,666,859

CONTRACTS PLACED

1500 tons, superstructure for Crawford avenue bridge, Chicago, to American Bridge Co.

1300 tons, Eagle avenue lift bridge, Cleveland, to Mt. Vernon Bridge Co.

1100 tons, Southwestern Bell Telephone building, Kansas City, Mo., to American Bridge Co.

1100 tons, Brooklyn Law school, Brooklyn, N. Y., previously noted as going to another fabricator, went to Igoe Bros.

850 tons, auditorium, Seattle, to Wallace Bridge & Structural Steel Co.

600 tons, Zellerbach paper mill, Hoquiam, Wash., to McClintic-Marshall Co.

600 tons, extension to power plant, Cleveland Electric Illuminating Co., Cleveland, to American Bridge Co.

600 tons, high level bridge of Nickel Plate railroad, Cleveland, to Fort Pitt Bridge Works.

475 tons, plant for Iron City Electric Co., Pittsburgh, through W. F. Trimble & Son Co., general contractor, to McClintic-Marshall Co.

400 tons, Zellerbach paper mill, Port Townsend, Wash., to McClintic-Marshall Co.

350 tons, mill building for the International Harvester Co., Fort Wayne, Ind., to Rochester Bridge Co.

350 tons, Pierce building, Broad street, Boston, to New England Structural Co.

325 tons, Union building, Duke university, Durham, N. C., to Southern Engineering Co.

390 tons, theater, Park Ridge, Ill., to Gage Structural Steel Co.

300 tons, state highway bridgework, Indiana, to Rochester Bridge Co.

300 tons, two 1-story buildings and 300-foot crane runway for Green Mountain Marble Corp., West Rutland, Vt., through Leo F. Caproni, structural engineer and general contractor, to Lehigh Structural Steel Co.

250 tons, factory for the Aspinook Co., Jewett City, Conn., to Eastern Bridge & Structural Co.

250 tons, plant building for Advance Pattern & Foundry Co., Chicago, to Gage Structural Steel Co.

200 tons, Hershey Chocolate Co. building, Hershey, Pa., to Belmont Iron Works.

200 tons, several small orders in the greater Pittsburgh area, to Guibert Steel Co.

200 tons, barge for Pacific Telephone & Telegraph Co., San Francisco, to Wallace Bridge & Structural Steel Co.

200 tons, small jobs of about 50 tons each, to Jones & Laughlin Steel Corp.

175 tons, high school, Middletown, N. Y., awarded to unnamed fabricator.

150 tons, 9-story apartment, 125 East Seventy-fourth street, New York, to Hay Foundry & Iron Works.

150 tons, Albany Knickerbocker-Press building, Albany, N. Y., to Kellogg Structural Steel Co.

150 tons, New York state highway bridge over Southern river, to Phoenix Bridge Co.

150 tons, transmission towers for the Philadelphia Electric Co., Philadelphia, to Belmont Iron Works.

125 tons, addition to warehouse for H. J. Heinz Co., Pittsburgh, through Austin Co., general contractor, to McClintic-Marshall Co.

120 tons, high school building at Walpole, Mass., to New England Structural Co.

116 tons, five 110-foot 6-inch highway spans for Gun Powder creek bridge, for Western Carolina Power Co. near Hickory, N. C., to Southern Engineering Co.
115 tons, Dupont bridge, Carneyspoint, N. J., to Fort Pitt Bridge Works.
107 tons, including 85 tons for Charleston Interurban garage, Charleston, W. Va., to Massillon Bridge & Structural Co.
100 tons, machine shop extension for F. R. Patch Mfg. Co., Rutland, Vt., through Leo F. Caproni, structural engineer and general contractor, to Lehigh Structural Steel Co.
100 tons, boiler supports for State Line Generating Co., Hammond, Ind., to Vierling Steel Works, in addition to tonnages previously placed.
100 tons, United Drug Co. warehouse, Boston, to E. A. Simpson.
100 tons, building for Quaker Oats Co., Cedar Rapids, Iowa, to Gage Structural Steel Co.

CONTRACTS PENDING

New Inquiry and Developments on Projects Previously Reported

3900 tons, Southern California Athletic and Country club, Los Angeles; bids being taken.
3500 tons, Stott Realty building, Griswold and State streets, Detroit; action expected this week on award.
3000 tons, Coyote Point bridge, San Francisco; bids to be asked shortly.
2000 tons, theater, stores and office building, Worcester, Mass.
1800 tons, bridge over Chicago river at Clark street, Chicago; bids being received.
1500 tons, post office garage, Back Bay district, Boston.
1400 tons, John Hays senior high school, Cleveland; Charles Shutrump & Sons, Youngstown, O., low on general contract.
1300 tons, Famous Players-Laskey theater, Toledo, O.; bids being taken.
1200 tons, theater on DeKalb avenue, Brooklyn, N. Y.
1200 tons, transmission towers for Pennsylvania railroad; bids asked.
1200 tons, Robey street bridge, Chicago; general contract awarded.
1100 tons, new Savoy-Plaza hotel, St. Louis; J. W. Knight, St. Louis, engineer.
700 tons, coal handling plant, Zenith Furnace Co., Duluth; bids being received.
600 tons, Shelton hotel, Cleveland; bids in.
550 tons, column cores for a factory building for E. R. Squibb & Son, 25 Columbia heights, Brooklyn, N. Y.; bids asked.
500 tons, bridge over Rock Island railroad, at Council, Okla.; general contract awarded.
500 tons, state highway bridge, Catskill, N. Y.
500 tons, 2-story garage, Nostrand avenue, Brooklyn, N. Y.; bids asked.
500 tons, junior and senior high school, Glass-New York; general contractors' bids to be asked.
450 tons, school, Providence, R. I. E. Turgeon general contractor.
400 tons, addition to Medical-Dental building, San Francisco; bids received.
400 tons, pulp plant, Port Townsend, Wash.; bids in.
350 tons, state highway bridge, Bound Brook, N. J.; bids asked.
250 tons, municipal building, Overbrook, Pittsburgh; bids being taken.
250 tons, township school, Wilkens, Pa.; bids being taken.
200 tons, bus terminal, Fields Corner district, Boston.
200 tons, theater, Peekskill, N. Y.
100 tons, Metropolitan state hospital, Waltham, Mass.
100 tons, 6-story office, 160 West Eighty-fifth street, New York.
Unstated tonnage, bridge over River Raisin, Monroe, Mich.; general contract to W. H. Knapp Co.
Unstated tonnage, medical officers quarters, United States Marine hospital, Savannah, Ga.; James A. Wetmore, Washington, supervising architect.

Pittsburgh-Chicago, has taken over the sale of brick made by the Big Savage Fire Brick Co., Frostburg, Md. Distribution will include fire brick as well as roof brick for heating furnaces, cupolas, etc.

Concrete Bars

Large Awards Are Fewer but Small Lots Continue Numerous—Prices Stiffen

AWARDS of large tonnages are getting fewer in the concrete bar market as the dull season becomes more pronounced. Small projects which can be completed quickly continue numerous but the total tonnage involved is small. Prices are stiffening following the recent merchant bar advances. Buffalo in the past week increased $2 a ton to 2.165c, Buffalo.

REINFORCING BAR PRICES, PAGE 1312

Chicago, Nov. 22.—Large sized reinforcing bar awards are dwindling. A fairly large amount of small-lot orders continue to come in. Dealers report that considerable work is pending, but that uncertainty prevails as to the outcome of a portion of this prospective business. About 700 tons of rail steel bars have been closed for the Shedd aquarium in Grant park, Chicago. Recent bids show a shading of the 2.30c billet bar price. Some awards have been on a basis below 2.20c. Recent rail steel bars have been awarded at 1.80c to 1.85c.

Boston, Nov. 22.—The concrete bar market has not developed any marked change in the past week. Jobs ahead that hold out promise of large tonnages are the north station for the Boston & Maine railroad, and the municipal auditorium. Scattered small lot tonnages continue to figure as the important part of the market.

Pittsburgh, Nov. 22.—New inquiries are scarce involving the use of concrete bars, and buyers are slow in closing on old ones. Several are asking for revised bids on projected buildings. Awards for the past week or ten days have been small, involving 10 to 50 tons apiece. Mill prices on new billet bars are stronger at the 1.80c minimum, but bids still evidence much competition.

Buffalo, Nov. 22.—Sellers have advanced reinforcing bar prices to 2.165c, Buffalo, an increase of $2 a ton from former quotations. Demand is fair. New inquiry listed this week includes about 500 tons, while sales have been less than half that amount.

Cleveland, Nov. 22.—With the exception of awards of 700 tons for Central avenue bridge and 125 tons for a postoffice at Akron, O., to Bourne-Fuller Co., the concrete reinforcing bar market again was dull in the past week, with awards and inquiries confined to small lots. A stiffening in prices is becoming more evident, with 1.80c, Pittsburgh, the quotation for outside mills. Insufficient tonnage has been bid in the past week to determine the extent of 1.75c, Cleveland mill, quotations. On stock delivery, 2.20c to 2.30c, Cleveland or Youngstown, still prevails.

Awards Compared

	Tons
Awards this week	6,825
Awards last week	6,465
Awards two weeks ago	5,239
Awards this week in 1926	9,670
Average weekly awards, Oct.	4,602
Average weekly awards, 1927	5,629
Total awards to date, 1926	304,280
Total awards to date, 1927	265,789

CONTRACTS PLACED

900 tons, new Pierce building, Broad street, Boston, awarded through E. A. Turner & Co. to unstated fabricator.
800 tons, factory for National City Candy Co., St. Louis, to Laclede Steel Co.
700 tons, Shedd aquarium, Grant Park, Chicago, to Calumet Steel Co.
700 tons, Central avenue and Central viaduct traffic bridge, Cleveland Union Terminals Co. project, Cleveland, to Bourne-Fuller Co.
600 tons, auditorium, Seattle, to Northwest Steel Rolling Mills.
500 tons, second unit, Skagit development, Seattle, to Northwest Steel Rolling Mills.
400 tons, Great Atlantic & Pacific Tea Co. warehouse, South Boston, Mass., to Kalman Steel Co.
300 tons, Salt creek intercepting sewer, Chicago, awarded by Underground Construction Co. to unnamed fabricator.
210 tons, barracks at Fort Lewis, Seattle, to Pacific Coast Steel Co.
200 tons, Shallcross school for boys, Bybery, Philadelphia, to Concrete Steel Co.
200 tons, coagulating basin of St. Louis Municipal water works, St. Louis, to Missouri Rolling Mill.
150 tons, hotel, Corning, N. Y., to Baltimore Fire Proofing Co.
150 tons, school, Lancaster, Pa., to Truscon Steel Co.
140 tons, apartments, Twentieth and Locust streets, Philadelphia, to A. Taylor Co.
125 tons, Webster college, Webster Groves, Mo., to Missouri Rolling Mill.
125 tons, post office, Akron, O., to Bourne-Fuller.
120 tons, including 100 tons for a building for Iron City Electric Co., reported awarded Carlem Engineering Co., which also received the 20-ton award for buildings for J. B. Sipe Varnish Co., Bridgeville, Pa., through Austin Co.
105 tons, sewer project, Tonawanda, N. Y., to Buffalo Steel Co.
100 tons, approximate, 1,000,000-gallon reservoir for water works, Ashland, Ky., through Hatfield Construction Co., Huntington, W. Va., general contractor, to unstated fabricator.
100 tons, highway bridges, Salem and Parrott, Oreg., to Northwest Steel Rolling Mills.
100 tons, gymnasium for LaFollette Memorial, Chicago, to American System of Reinforcing.
100 tons, including 50 tons for Pittsburgh & Lake Erie Y. M. C. A. building, Newall,

Pa., to Truscon Steel Co.
Unstated tonnage, barracks at Camp Meade, Md., through Palmer-Spivey Construction Co. to Kalman Steel Co.

CONTRACTS PENDING

New Inquiry and Developments on Projects Previously Reported

600 tons, Savoy-Plaza hotel, St. Louis; J. W. Knight, St. Louis, engineer.
400 tons, building for E. R. Squibb & Sons, Brooklyn, N. Y.
300 tons, road mesh, Geneva, Willard, N. Y., bids in Nov. 29 at Albany, N. Y.
300 to 400 tons, hospitals, Toledo, O.; A. Bentley & Son reported awarded general contract.
200 to 500 tons, new post office garage, Back Bay district, Boston.
125 tons, school, Lancaster, Pa.
100 tons, school No. 23, Buffalo; bids in Dec. 1.
100 tons, building for Packard Motor Co. at Pittsburgh; revised bids being taken.
100 tons, high school, North Braddock Pa.; general contract awarded Hodder Construction Co., Pittsburgh.
Unstated tonnage, Sheridan-Glengyle apartment hotel, 5036 Sheridan road, Chicago; Joseph Cohen & Co., architects.

Steel Barrel Production Has Increase

Washington, Nov. 22.—October production of steel barrels, totaling 578,408, showed an increase over September, according to department of commerce statistics. Shipments in October totaled 572,893.

Members of the Steel Barrel Manufacturers' association, Cleveland, report 345,782 barrels shipped in October, with unfilled orders 507,817. October volume of business was $1,115,297.84. I. C. C. barrels were produced at 35.7 per cent of capacity, light barrels at 50.9 per cent and the entire industry at 47.6 per cent.

Further monthly comparisons follow:

1926	Production	Shipments	Unfilled orders for delivery within 30 days	Unfilled orders for delivery beyond 30 days
Oct.	493,363	497,031	222,491	926,834
Nov.	510,489	595,383	332,106	1,399,901
Dec.	539,805	546,892	349,491	1,496,496
1927				
Jan.	529,137	525,518	244,108	1,544,086
Feb.	504,134	503,183	252,012	1,411,760
Mar	575,850	568,821	285,802	1,260,278
Apr.	599,771	609,090	296,395	1,069,160
May	588,077	575,712	250,029	947,865
June	594,782	605,123	232,468	966,371
July	578,223	576,602	308,789	1,037,899
Aug.	615,152	610,454	244,518	862,086
Sept.	521,899	525,374	235,181	889,256
Oct.	578,408	572,893	211,665	788,894

Chicago to Indianapolis Rates Are Hit

Washington, Nov. 22.—Harry C. Barron, examiner of the interstate commerce commission, has prepared a proposed report for the commission in which he found rates on iron and steel articles, in carloads, from Chicago and points within the Chicago switching district and from Gary, Ind., and Chicago Heights and Joliet, Ill., over interstate routes to Indianapolis are unreasonable. Reasonable rates are prescribed for the future from Joliet and reparation was awarded.

Rails, Cars

Equipment Market Shows More Life—Rail Bookings Continue Heavy at Chicago

DEFINITE issuance of an inquiry for 2250 freight and 16 passenger cars by the Louisville & Nashville and asking of bids by the Sante Fe for 3750 freight and 76 passenger cars has improved the tone of the equipment market. Rail contracts continue to be booked by Chicago mills, 65,000 to 68,000 tons being the week's total.

RAILROAD TRACK MATERIAL PRICES, PAGE 1312

Chicago, Nov. 22.—While about 65,000 to 68,000 tons of standard steel rails have been purchased in this market during the week by three railroads with terminals in Chicago, the distribution of this tonnage is not announced. Estimates here are that about 300,000 tons of rails remain to be placed for 1928 programs. Light rail buying is in miscellaneous lots. About 25,000 to 30,000 tons of fastenings also have been placed with mills in this district, and smaller tonnages are on inquiry.

Rail mill operations in the Chicago district have been stepped up slightly and now are about 45 per cent.

Receivers for the Chicago, Milwaukee & St. Paul have been authorized by the federal court to spend $500,000 for improvements and replacements, including some bridge work. Chicago & Eastern Illinois will be in the market shortly for 500 standard automobile cars.

Santa Fe is asking bids on 3750 freight and 76 passenger cars, the largest inquiry in months.

New York, Nov. 22.—Outstanding in the eastern car market is the formal issuance of an inquiry by the Louisville & Nashville for 2250 freight cars and 16 passenger cars. This inquiry was referred to in last week's issue as contemplated and is the largest to come out in this district in some time. This year's record is not expected to exceed that of 1926 when approximately 60,000 freight cars were placed. To date the showing for 1927 is behind 1926.

Pittsburgh, Nov. 22.—Better conditions prevail this month in light rails. Orders are more numerous although small individually. Buyers usually are satisfied to place a single carload or two and these in almost every case are going into coal mines. The price still is $36.

Track accessory inquiries have not developed to expected proportions in this district. Some roads are understood to be formulating inquiries for spikes and tie plates, but inquiries in hand come from western roads. Prices are unchanged at 2.80c for spikes and 2.25c for tie plates.

CAR ORDERS PLACED

H. C. Frick Coke Co., 490 mine cars, to Lorain Steel Co.
Hudson & Manhattan, 25 passenger cars, reported awarded American Car & Foundry Co.
New York Rapid Transit Co., triplex articulated car units, to Pressed Steel Car Co.
Sterling Products Co., Easton, Pa., one rubber lined tank car, to General American Tank Car Corp.

LOCOMOTIVE ORDERS PLACED

Detroit & Toledo Shore Line, four locomotives, to Baldwin Locomotive Works.

CAR ORDERS PENDING

New Inquiry and Developments on Projects Previously Reported

Atchison, Topeka & Santa Fe, 3750 miscellaneous freight cars and 76 passenger cars.
Chicago & Eastern Illinois, 500 standard automobile cars.
Chicago Great Western, 50 center sills.
Great Northern, four heater cars; bids asked.
Louisville & Nashville, 2250 freight cars and 16 passenger cars; previously noted as contemplated, bids asked.
Pittsburgh Railways Co., 15 interurban cars; bids asked.

Stoker Sales Decline

Washington, Nov. 22.—Sales of mechanical stokers in October continued to slump, totaling 95, compared with 104 in September and 112 in October, 1926, according to the department of commerce. Further comparisons follow:

	Stokers sold	Fire tube boilers	Water tube boilers
1923 Total	1,464	177	1,287
1924 Total	1,128	161	967
1925 Total	1,348	263	1,085
1926			
October	112	28	84
November	85	25	60
December	72	7	65
Total	1,361	289	1,072
January, 1927	69	18	51
February	105	27	78
March	115	25	90
April	77	22	55
May	97	16	81
June	153	49	104
July	136	42	94
August	160	60	100
September	*104	*48	*56
October	95	37	58

*Revised.

Employes of the Pacific Coast Steel Co., Seattle, have been covered by a group insurance. The coverage includes 600 workers at Seattle and Portland, Oreg.

Wire

Concessions Made Less Readily as Producers Hold Prices—Small Buying Steady

BUYING of wire continues to be in small lots and for immediate needs only. Stocks are being kept low as inventory approaches. Makers are seeking to hold prices and concessions are less readily obtained. Production remains practically steady at the October rate and bookings also are practically at the level of that month.

WIRE PRICES, PAGE 1312

Chicago, Nov. 22.—While some sales of wire nails are made at $2.55, less tendency is shown by producers to make concessions and they are seeking to hold the $2.60 price. Buying, while of a short range nature, is steady on the part of the manufacturing trade. The Northwest and Southwest are buying more freely than in certain parts of the South and West. Plain wire is 2.45c.

Worcester, Mass., Nov. 22.—New business in wire and wire products is slow to develop. Both manufacturing and wholesale trade are buying close to requirements and are slow to contract even with reports of price concessions offered against future business.

Pittsburgh, Nov. 22.—Wire orders are slack, the rate being practically the same as in October. One large interest which sold 764 tons in the first 20 days of last month, has in the same period this month sold 746 tons. Wire nail orders are picking up a trifle although in small quantities. Jobbers' stocks are much below normal for this time of the year, being kept purposely low against inventory-taking. While on nails $2.50 has become general, the plain wire price has not receded and 2.40c is held.

Cleveland, Nov. 22.—Competition from mills along the Ohio river has tended to weaken the nail price in the Cleveland territory. For Cleveland delivery, $2.50 to $2.55 per 100-pounds keg holds steady, but this minimum has been shaded by $1 or more in the southern part of the state. Wire continues firm at 2.40c, Cleveland, for local delivery.

Philadelphia, Nov. 22.—Nails are somewhat firmer with an increasing proportion of business going at $2.25, Pittsburgh. Prices under this figure are exceptional. Wire is firm at 2.40c.

Bolts, Nuts, Rivets

Buying Not Sufficient to Increase Production Schedules

NUT AND BOLT PRICES, PAGE 1312

Pittsburgh, Nov. 22.—Sales of nuts, bolts and rivets are more frequent this month than last although tonnages in individual orders are practically the same. Operating schedules have not expanded and the average is 50 to 55 per cent. More orders from manufacturers related to the oil industry have been received but business from automotive and allied lines is practically absent. The implement trade is buying and some structural shops have purchased additional rivets. Orders from car builders are few. The bolt discount is still 70 off. The open market rivet price is firm at 3.00c, but most customers protected themselves with contracts at 2.75c against which they are issuing specifications with regularity.

Cleveland, Nov. 22.—Specifications for bolts and nuts continue at a good seasonal rate. Business equals last year and shows a slight improvement over October. Automotive interests have been more active in buying. Operations average 65 per cent. Demand for rivets continues to lag, larger consumers specifying only for current needs.

Detroit, Nov. 22.—Sales of bolts and nuts show little change compared with October and little improvement is looked for soon. Inquiries from automobile manufacturers are showing some increase and better buying is in prospect for December.

Chicago, Nov. 22.—Specifications for bolts, nuts and rivets from farm implement manufacturers, which for two months has stimulated demand, are easing off as implement interests have autumn business out of the way and have started building up warehouse stocks. Spot quotations for large structural rivets are slightly firmer at 3.10c, Chicago. Bolts are 70 off for attractive business. Some small-lot spot business is taken at 60 off.

Cold Finished Steel

Specifications Improve in Spite of Slack Automotive Industry Demand

COLD FINISHED PRICES, PAGE 1312

Pittsburgh, Nov. 22.—Without much help from automotive consumers, specifications on cold finished bars have mounted. Orders have been from diversified consuming lines and some makers have been able to increase operating schedules to 55 or 60 per cent of capacity. The average is now 55 instead of 50 per cent. Increase of tonnage so far this month over October to the same date is 15 to 20 per cent. The price situation is unchanged, 2.20c being the openly quoted figure.

Cleveland, Nov. 22.—Lack of purchasing by the automotive trade is keeping cold finished steel bar sales low. Although a few attractive tonnages were placed recently at 2.15c, Cleveland, smaller mills are holding firmly to 2.25c as a minimum. Larger mills are not as firmly established in price and the spread of 2.15c to 2.25c is more representative of business done by heavy producers.

Strip Steel

Need of Firmer Price Policy but Competition Continues

STRIP PRICES, PAGE 1312

Pittsburgh, Nov. 22.—Strip steel prices continue to seek a firmer basis, and while most producers are faced with financial statements for the past three quarters which seem to demand a firmer price policy for the final quarter, they still encounter much price competition. Specifications appear to be on the increase and it may be possible to increase operations and thus lower costs. Some business is developing but the tonnage is disappointing since major automotive buying is still withheld. Strip mill operations for the month will not exceed 50 to 60 per cent, although some plants are now on a 65 per cent basis. Prices generally named are 3.25c on cold strips (up to three tons of a size at a time); on hot strips 6 to 12-inch, 2.00c to 2.10c; wider at 1.95c or lower in meeting plate competition; and hoops and bands at 2.20c to 2.30c.

Detroit, Nov. 22.—Demand for strip steel continues spotty but some improvement is seen. This is taken as a sign that better business is in prospect. While prices continue to show some fluctuation, quotations as a whole are steadier.

Chicago, Nov. 22.—Hot rolled strip steel sales, which have been showing a decrease the past six weeks due to the automotive situation, show signs of increase next month, according to schedules of some automotive and parts manufacturers. Quotations have been shaded. Strip under 6-inch recently has been quoted as low as 2.30c to 2.40c, and material over six inches wide 2.10c to 2.20c.

Cleveland, Nov. 22.—Without enough buying to determine a definite price for hot rolled strip steel, quotations continue to vary widely. Despite the fact that several mills continue to quote 2.00c and 2.10c, Pittsburgh, on 6 to 12-inch, and get those prices on some lots, other mills openly are naming 1.90c for tonnages. For widths under 6-inch, 2.05c to 2.15c, Pittsburgh, is common. Cold rolled strip steel is fairly steady but quotations continue to vary from 2.90c to 3.00c for three tons of a size and over, Cleveland.

Nonferrous Metals

Buying Picks Up As Consumers' Early Needs and Stronger Prices Bring Out Orders —Display of Strength Is General

Prices of the Week, Cents a Pound

	Copper			Straits Tin							
	Electro delivered	Lake delivered	Casting refinery	New York Spot	New York December	Lead New York	Lead East St. Louis	Zinc St. Louis	98-99% Aluminum	Spot Antimony	Ingot Nickel
Nov. 16	13.50	13.65	13.15	57.12½	57.00	6.25	6.00	5.70	24.80	10.75	35.00
Nov. 17	13.62½	13.70	13.25	57.37½	57.00	6.25	6.00	5.70	24.80	10.87½	35.00
Nov. 18	13.62½	13.70	13.37½	57.87½	57.75	6.25	6.02½	5.75	24.80	10.75	35.00
Nov. 21	13.75	13.80	13.42½	58.25	58.25	6.25	6.05	5.80	24.80	10.75	35.00
Nov. 22	13.75	13.80	13.42½	58.37½	58.37½	6.25	6.05	5.82½	24.80	10.87½	35.00

NEW YORK, Nov. 22.—Buying of nonferrous metals picked up during the past week, partly due to early needs of some users and partly because the price situation encouraged purchasing. Prices of nearly all the metals showed the most concerted strength in a long time. Copper is at the highest price in a year and other metals have made substantial price recoveries from their lowest points.

The buying is larger than at most times in the autumn but still is not extraordinarily heavy. Sales of copper for export, however, are of unusual size. In copper and lead most domestic business has been for this year, but in the past day or two some January business has been done. In zinc and tin buying has been largely for next year and extended into positions well through the winter.

Mill products, which have been slow to follow copper, now are up ¼-cent. For most of the products this is the first change since early August, but copper sheets and commutator copper recently went up ¼-cent, so that they now are up ½-cent.

Copper—All producers are firm at 13.75c, Connecticut, after recent sales at 13.50c to 13.62½c. For midwestern delivery prices are mostly about ⅛-cent over eastern. The export price has been raised to 14.05c c.i.f. European ports. Good business was done prior to the last advances and there are indications of further interest. Statistically and in sentiment the market is the strongest in a long time.

Zinc—Prime western has sold at 5.80c, East St. Louis, for this year and 5.85c for next quarter. Business has not been large but sufficient to be encouraging. Ore has recovered $1 a ton to $36.

Lead—Buying has picked up in the past few days and the East St. Louis price has come closer to the New York price.

Tin—Prices of tin have gone up about 1½ cents in the past week with fairly active business, mostly futures. In the past few days buying has been large and at the highest prices in several weeks. Spot and futures are practically at one price, a relation that has not existed in several years. Supplies at present are plentiful.

Aluminum—Buying continues quiet and prices are unchanged.

Mercury Is Unchanged

New York, Nov. 22.—Quicksilver is unchanged and firm, mostly at $128 to $129 a flask, but with some asking prices higher.

Mill Products

Base prices cents per pound, f.o.b. mill

SHEETS	
Yellow brass (high)	18.50
Copper, hot rolled	22.50
Lead full sheets (cut ¼c more)	9.75
Zinc (100-pound base)	10.00
Aluminum, flat sheets, up to 10 gage, 8" to 72" wide	32.00
SEAMLESS TUBES	
Yellow brass (high)	23.37½
Copper	24.25
RODS	
Yellow brass (high, free turning)	16.25
Naval brass	19.00
WIRE	
Copper, small lots	15.25
Yellow brass (high)	19.00

Old Metals

Dealers' buying prices, cents per pound

HEAVY RED BRASS	
New York	9.00 to 9.25
Chicago	9.25 to 9.50
Cleveland	9.25 to 9.50
HEAVY YELLOW BRASS	
Chicago	6.75 to 7.00
Cleveland	7.00
ZINC	
New York	3.50 to 3.75
Cleveland	3.50
HEAVY COPPER AND WIRE	
New York	11.25 to 11.50
Boston	10.50 to 10.75
Chicago	10.00 to 10.50
Cleveland	10.75 to 11.00
RED BRASS BORINGS	
New York	8.00 to 8.25
YELLOW BRASS TUBING	
Cleveland	7.50 to 7.75
LIGHT COPPER	
New York	9.25 to 9.50
Chicago	9.25
Cleveland	9.50 to 9.75
LIGHT BRASS	
Boston	5.25 to 5.50
Chicago	6.25
Cleveland	5.25 to 5.50
ALUMINUM	
Clippings, Cleveland	17.00
Borings, Cleveland	9.00
Cast, Cleveland	13.00
Cast, Boston	13.00 to 13.50

Secondary Metals

Remelt aluminum No. 12	17.00 to 18.00
Bras ingot, 85-5-5-5	12.00 to 12.25

Coke By-Products

Distillates Are Firmer, with Better Market Foreseen

New York, Nov. 22.—Prices on light oil distillates are firmer, due to anticipation by sellers of a more active market soon. Prospects are brighter, particularly in toluol, commercial xylol and benzol. Prices on pure and 90 per cent benzols are holding. Producers of sulphate of ammonia are looking for a little improvement before Jan. 1. At that time fertilizer manufacturers who have not closed on requirements are likely to come in for substantial spot tonnages for spring. Meanwhile, prices are unchanged. Naphthalene is quiet.

Coke Oven By-Products

Per Gallon at Produdcers' Plants in Tank Lots

	Spot	Contracts
Pure benzol	$0.23	
90 per cent benzol	0.23	
Toluol	0.35	
Solvent naphtha	0.35	
Commercial xylol	0.36	
Phenol	0.19 to 0.20	

Per Pound at Producers' Plants

Naphthalene flakes	0.05 to 0.06
Naphthalene balls	0.06 to 0.07

Per 100 Pounds Delivered

Sulphate of ammonia	$2.30 to $2.35

Plan Russian Steelworks

New York, Nov. 22.—The Russian soviet government has contracted with Percival Farquhar, 120 Broadway, New York, for construction of a steel plant at Makieffka, southern Russia, to cost $20,000,000, according to the *New York Times*. Mr. Farquhar last year sent to Russia engineers, including representatives of Perin & Marshall.

Muncie Gear Works, Muncie, Ind., has reduced its common capital stock from $300,000 to $150,000, and also reduced the number of directors from seven to five.

Warehouse

Gradual Recession of Jobber Business Reported in Some Districts as Seasonal Influences Are Felt

SALES from warehouses in November are expected to fall below those of October, due to fewer business days, seasonal influences and decreased demand for building materials. Despite weakness of mill quotations on some products, the warehouse levels remain steady.

Philadelphia jobbers have reduced cold rolled strip steel prices from warehouse to 4.75c, base, delivered locally, plus the regular mill extras, the regular size extras and the new quantity differentials which have the effect of advancing prices on small lots and reducing on large lots. This tends to make it more profitable for large consumers to buy more extensively from jobbers.

Jobbers at Pittsburgh say that orders are fewer this month than in October. Warehouse quotations did not decline at the time of the recent mill price reductions; hence they do not reflect the advance in mill prices made Nov. 10. Cold-finished bar demand has picked up slightly. Cold-finished rounds and hexagons are 3.60c and flats and squares 4.10c.

Jobbing demand in the New York metropolitan district is being maintained at the rate of last month. The recent mill advance in shapes, plates and bars has not been reflected as yet in prices, and little change is expected. Sheet quotations continue irregular.

Warehouse sales of iron and steel at Buffalo this month are running about even with October. The quarter to date shows a gain over last quarter but is well behind 1926. Demand for building construction materials is declining, but some other materials, notably sheets and bars, are selling more freely. Prices are unchanged.

Warehouse sales in the Cleveland district are easing off, and with a decreased number of business days November totals are expected to drop 5 to 15 per cent behind October. The season and weather are hampering building material sales. Prices are holding firm on sales out of stock although competition from mills for small lots may have a tendency to lower quotations on attractive business.

Detroit warehouses are marking time. Demand is small and somewhat below last month. Little improvement is looked for the next 30 days. Bars are in fair demand. Prices are steady and unchanged.

St. Louis warehousemen report business irregular and spotty, with a slowing down on some commodities. On an average, the volume of sales is below the same period last year. Completion of harvest, which turned out better than expected, has had a stimulating effect on demand for farm goods. No improvement has taken place in oil country goods.

Woodward Body Works, Austin, Tex., has changed its name to Woodward Mfg. Co.

Warehouse Quotations in Cents Per Pound at Leading Market Centers

STEEL BARS

Baltimore	2.60c to 3.31c
Boston	3.265c
Buffalo	3.30c
Chicago	3.00c
Cincinnati	3.30c
Cleveland	3.00c
Detroit	3.00c
Ft. Worth	3.75c
Los Angeles	3.40c
New York	3.24c
Philadelphia	2.50c to 3.20c
Pittsburgh	2.85c to 2.90c
Portland	3.00c
San Francisco	3.15c
Seattle	3.00c
St. Louis	3.15c
St. Paul	3.25c
Tulsa	3.75c to 4.06c

IRON BARS

Baltimore	2.60c to 3.31c
Boston	3.265c
Buffalo	3.30c
Chicago	3.00c
Cincinnati	3.30c
Detroit	3.00c
Ft. Worth	3.75c
New York	3.24c
Philadelphia	2.50c to 3.20c
St. Louis	3.15c
Tulsa	3.75c to 4.06c

REINFORCING BARS

Baltimore	2.80c to 3.31c
Boston	3.265c to 3.50c
Buffalo	2.75c
Cincinnati	3.00c
Cleveland	2.20c
Detroit	3.00c
Ft. Worth	3.75c
*Los Angeles	3.05c
**Los Angeles	3.30c
New York	2.95c
Philadelphia	2.50c to 3.20c
Pittsburgh	2.50c to 2.75c
*San Francisco	2.85c
**San Francisco	3.10c
Seattle	3.00c
St. Louis	3.15c
Tulsa	3.75c to 4.00c
Youngstown	2.30c

*Carload. **Less carload.

STRUCTURAL SHAPES

Baltimore	2.60c to 3.41c
Boston	3.365c
Buffalo	3.40c
Chicago	3.10c
Cincinnati	3.40c
Cleveland	3.00c
Detroit	3.10c
Ft. Worth	4.25c
Los Angeles	3.40c
New York	3.34c
Philadelphia	2.50c to 3.20c
Pittsburgh	3.00c
Portland	3.00c
San Francisco	3.15c
Seattle	3.00c
St. Louis	3.25c
St. Paul	3.35c
Tulsa	3.75c to 4.16c

PLATES

Baltimore	2.60c to 3.41c
Boston	3.365c
Buffalo	3.40c
Chicago	3.10c
Cincinnati	3.40c
Cleveland, ¼-in and thicker	3.00c
Cleve., 3/16-in.	3.20c
Detroit	3.10c
Detroit, 3/16-in.	3.30c
Ft. Worth	4.50c
Los Angeles	3.40c
New York (sheared and universal)	3.34c
New York (floor)	5.25c
Philadelphia	2.50c to 3.20c
Phila., 3/16-in.	2.70c to 3.40c
Pittsburgh	3.00c
Portland	3.00c
San Francisco	3.15c
Seattle	3.00c
St. Louis	3.25c
St. Paul	3.35c
Tulsa	3.75c to 4.16c

No. 10 BLUE ANNEALED SHEETS

Baltimore	3.20c to 3.66c
Boston, 3/16-in.	3.915c
Buffalo	3.70c
Chicago	3.50c
Cincinnati	3.60c
Cleveland	3.25c
Detroit	3.50c
Ft. Worth	4.70c
Los Angeles	3.85c
New York	3.50c to 3.65c
Portland	4.00c
Philadelphia	3.10c to 3.20c
Pittsburgh	3.20c
San Francisco	3.75c
Seattle	4.00c
St. Louis	3.60c
St. Paul	3.75c
Tulsa	4.20c to 4.56c

No. 24 BLACK SHEETS

Baltimore	3.60c to 4.30c
Boston	5.00c
Buffalo	4.20c
Chicago	3.95c
Cincinnati	4.05c
Cleveland	3.75c
Detroit	4.10c
Ft. Worth	4.70c
Los Angeles	5.10c
New York	3.75c to 4.00c
Philadelphia	4.10c to 4.25c
Pittsburgh	3.65c
Portland	4.90c
San Francisco	4.80c
Seattle	5.00c
St. Louis	4.45c
St. Paul	3.95c
Tulsa	4.75c

No. 24 GALVANIZED SHEETS

Baltimore	4.30c to 5.45c
Boston	5.85c
Buffalo	5.05c
Chicago	4.80c
Cincinnati	4.90c
Cleveland	4.50c
Detroit	4.90c
Ft. Worth	5.75c
Los Angeles	5.30c
New York	4.60c to 4.70c
Philadelphia	5.00c to 5.10c
Pittsburgh	4.50c
Portland	5.65c
San Francisco	5.35c
Seattle	5.75c
St. Louis	5.25c
St. Paul	4.90c
Tulsa	5.55c

BANDS

Baltimore	3.40c to 4.06c
Boston	4.015c
Buffalo	4.05c
Chicago	3.65c
Cincinnati	3.95c
Cleveland	3.65c
Detroit	3.65c
Ft. Worth	4.40c
Los Angeles	4.25c
New York	3.99c
Philadelphia	3.40c to 3.90c
Pittsburgh	3.60c
Portland	4.00c
San Francisco	4.00c
Seattle	4.00c
St. Paul	3.90c
Tulsa	4.71c

HOOPS

Baltimore	4.16c
Boston	5.50c
Buffalo	4.05c
Chicago	4.15c
Cincinnati	4.40c
Cleveland	3.65c
Detroit	4.15c
New York	4.49c
Philadelphia	3.65c to 4.25c
Pittsburgh	4.25c to 4.50c
Seattle	5.00c
St. Paul	4.40c

COLD FINISHED STEEL

	Rounds, hexagons	Flats squares
Baltimore	4.00c	4.50c
Boston	4.05c	4.55c
Buffalo	3.95c	4.45c
Chicago	3.60c	4.10c
Cincinnati	3.85c	4.35c
Cleveland	3.65c	4.15c
Detroit	3.85c	4.35c
Los Angeles	5.25c*	.....
New York	3.30c†	3.80c†
Philadelphia	3.25c†	3.75c†
Pittsburgh	3.60c	4.10c
Portland	5.00c*	.....
San Francisco	4.25c*	.....
Seattle	5.00c*	.....
St. Paul	3.85c	.....
Tulsa	4.66c	5.16c

*Rounds only.
†Plus quantity extras.

COLD ROLLED STRIP

Boston, 0.100-inch, 500-lb. lots	6.00c
Buffalo	5.85c
Chicago*	6.10c
Cincinnati	7.15c
Cleveland*	5.95c
Detroit*	6.05c
New York	5.75c to 6.25c
Philadelphia	4.75c†

*Net base, straightening, cutting, boxing one ton or more.
†Plus mill size and quantity extras.

SWEDISH IRON AND STEEL

New York duty paid

Hollow drill steel	14.00c
Iron bars, rounds	6.25c
Flats and Squares	
Baltimore, New York, Phila.	6.60c

Coast Sees Dull Era

Little Activity Expected Until Turn of Year—Building Operations Only Feature

SAN FRANCISCO, Nov. 19.—(*By Air Mail*)—The trade on the coast is inclined to be pessimistic over the outlook for the rest of the year and many look for little real tonnage to be placed until after Jan. 1. One of the most discouraging factors is the extremely low price quoted on certain steel products.

Building operations appear to be on the increase and several cities report that permits issued already this month exceed the whole of October of this year and of 1926.

Pig Iron and Coke

Consumers of foundry pig iron and coke continue to show little interest and in most cases purchases involve small lots for immediate consumption. During the week a shipment of 1000 tons of India iron arrived. About 500 tons of this is being unloaded at Los Angeles, the remainder to be delivered at this port next week. Practically all of this shipment will apply against contracts placed several months ago. No change in prices is noted.

Coast Pig Iron Prices

Utah basic	$25.00 to 26.00
Utah foundry	25.00 to 26.00
*German	24.25
*Indian	25.00
* Dutch	24.50

*C.i.f. duty paid.

Bars, Plates and Shapes

Demand for mild steel bars is exceptionally light and local producers have curtailed schedules. The open hearths at the plant of the Judson Mfg. Co., Emeryville, are all down and only two are operating at the South City plant of the Pacific Coast Steel Co. Awards of concrete bars this week totaled 1504 tons, bringing the aggregate for the year to 55,078 tons, compared with 37,158 tons for the corresponding period in 1926. Included among the larger lots were 600 tons for the Seattle auditorium and 500 tons for the Skagit river development near Seattle, both booked by the Northwest Steel Rolling Mills. The largest inquiry in the market this year calls for 8500 tons for the Coyote Point bridge across San Francisco bay, bids on which have been received. The out-of-stock price on large lots of 2.75c to 2.85c is now nominal and recent quotations on desirable tonnages have been considerably below this. Foreign material is quoted at 1.65c to 1.70c c.i.f., duty paid. Mill quotations on reinforcing material range around 2.00c, with lower price prevailing on large tonnages.

After a month or six weeks of fair activity in the plate market, demand has dwindled down again to almost nothing. Reconstruction of the Verde pipe-line at Phoenix, on which bids were taken for several types of pipe, including 600 to 1000 tons of riveted pipe, has gone reinforced concrete and was booked by the Western Concrete Pipe Co., Los Angeles. The only pending inquiry involves 620 tons for an electrically-welded pine-line at Ventura, Calif.

Awards of structural steel shapes this week totaled 1150 tons, bringing the aggregate for the year to 126,200 tons, compared with 106,479 tons for the corresponding period in 1926. Among the awards were 850 tons for the Seattle auditorium and 200 tons for a barge for the Pacific Telephone & Telegraph Co., San Francisco, both booked by the Wallace Bridge & Structural Steel Co., Seattle. Pending business includes 3900 tons for an athletic and country club in Los Angeles, 3000 tons for the Coyote Point bridge, San Francisco, and 400 tons for the Medical-Dental building addition, San Francisco, bids on the latter having gone in. Plain domestic material continues 2.40c c.i.f.

Other Finished Material

A slight falling off in demand for cast iron pipe is noted and awards this week included only two projects involving over 100 tons. The largest called for 244 tons for Burbank, Calif., and was placed with the Pacific States Cast Iron Pipe Co. and the American Cast Iron Pipe Co. Cast iron pipe mill representatives were disappointed in the decision reached by Phoenix, Ariz., to use reinforced concrete pipe in the reconstruction of the Verde pipe-line.

Sheet Sales Down but Production Gains

Pittsburgh, Nov. 22.—While sheet sales dropped off in October, production increased measurably and shipments increased slightly, according to the National Association of Sheet and Tin Plate Manufacturers. These in a minor way correct the approximate figures given on page 1188 of the Nov. 10 issue of IRON TRADE REVIEW.

October sales totaled 234,358 tons, compared with 258,427 tons for September—68.4 and 73.3 per cent, respectively. Production increased 24,846 tons, going to 245,765 tons, or 71.7 per cent in October, from 220,919 tons, or 62.6 per cent, in September. Shipments aggregating 232,626 tons, or 67.9 per cent, were greater in October by 2183 tons than in September.

Comparison for the two months follows:

	Oct., 1927 Net tons	Per cent capacity	Sept., 1927 Net tons	Per cent capacity
Sales	234,358	68.4	258,427	73.3
Production	245,765	71.7	220,919	62.6
Shipments	232,626	67.9	230,443	65.3
tonnage	*308,264	89.9	†350,117	99.3
Stock awaiting shipment	95,462	27.9	102,554	29.1
Stock, unsold	50,518	14.7	53,311	15.1

*Nov. 1. †Oct. 1.

In making comparisons from September onward with monthly data prior to September, the fact that revised rating capacities for sheet and jobbing mills have been adopted should be taken into consideration. Commencing with September, the standard for rating mill capacities for statistical purposes has been determined at 8.67 net tons per turn, as against 7.65 net tons per turn, the rating prevailing for several years prior to September. The new rating for jobbing mills is 22.56 net tons per turn, as against 22.635 net tons per turn. This represents an increase of 13.3 per cent on sheet mills and a decrease of 0.3 per cent on jobbing mills. Taking the tonnage of both sheet and jobbing mills as a whole, however, the increase in total capacity is approximately 11 per cent.

The reasons for adopting the changes include improvement in both equipment and mill practice as well as collateral reasons, such as a greater percentage of heavier gages rolled.

A table of sheet sales, production and shipments by months for two years, follows:

	Sales	Production	Shipments
October	234,358	245,765	232,626
September	258,427	220,919	230,443
Aug.	177,647	266,645	266,713
July	230,715	237,243	252,034
June	224,321	300,706	281,395
May	212,337	309,360	302,759
April	292,965	316,100	300,858
March	345,900	359,340	338,436
February	241,951	282,171	261,412
January, 1927	261,357	256,856	239,019
December	240,862	238,345	219,498
November	185,235	278,455	262,797
October	212,029	314,598	301,474
September	448,147	307,459	302,198
August	283,055	293,703	281,602
July	352,414	239,764	264,025
June	284,319	368,448	262,231
May	201,743	264,541	267,299
April	249,866	294,811	288,759
March	304,233	319,132	320,628
February	181,101	299,553	290,026
January, 1926	253,323	328,643	333,485

The total number of hot mills in the United States is 719, having a capacity for October of approximately 472,050 net tons, and the percentage of the capacity to which the figures shown above are related is 72.6.

Malleable Castings Show Good Gain

Washington, Nov. 22.—October production of malleable castings, totaling 46,765 tons, was slightly in advance of September, according to the department of commerce. Bookings in October also increased, the total being 39,494 tons. Operations were at 46 per cent of capacity in October. Further monthly comparisons follow:

	Total tons produced	Per cent of capacity	Total tons booked	Monthly capacity
Total 1925	737,582	54.4	653,233	1,355,315
1926				
October	57,175	52.6	45,490	**108,638
(10 mos.)	619,564	.....	527,605	1,096,873
November	45,793	42.7	40,294	**107,185
December	50,017	48.2	40,051	103,831
Total	715,384	54.7	607,949	1,307,889
1927				
January	*51,492	48.8	50,994	105,619
February	*57,380	54.8	58,039	104,686
March	66,372	62.2	53,597	106,698
April	59,225	55.8	56,326	106,163
May	57,655	54.1	49,482	106,473
June	58,972	55.3	46,178	106,736
July	48,202	43.9	45,782	104,287
August	51,394	48.6	42,515	105,717
September	45,210	43.3	37,912	104,401
October	46,765	46*	39,494	101,606
Total (10 mos.)	542,667	.....	480,319	1,052,326

**Capacity since May has been based on following formula: "Total number of units of molding floor space, times average production per molder per day per unit of floor space, times number of actual working days per month."

Electric Heat Treating Conference Planned

A conference on industrial electrical heat treatment will be held at Yale university, New Haven, Conn., Nov. 30, under the direction of the electrical engineering department of the university in co-operation with the Manufacturers Association of Connecticut. Sessions will be held in the morning, afternoon and evening. Ten technical papers have been arranged and among the speakers are members of the university staff and manufacturers and users of electric heating equipment.

Abandons Hornsey Plant

The Hornsey Iron Co., Birmingham, Eng., now is in liquidation. The plant was constructed in 1922 to utilize the commercial possibilities of producing iron in a rotary kiln fed with powdered coal and iron ore. The cost of production, it is said, amounted to about $5 a ton lower than usual blast furnace practice. The inventor was John W. Hornsey, a consulting engineer of New York. A plant to be operated along similar lines now is nearing completion at the Lorain, O., division of the National Tube Co.

Would Organize for Cast Iron Research Work

The Philadelphia Foundrymen's association recently addressed a letter to all foundrymen's groups in the country to learn the attitude toward "the advisability of instituting a cast iron research body to look into the various problems regarding cast iron and its uses in the trade." The purpose of such an organization would be to study the characteristics of cast iron and to learn how far business of foundries might be increased by a thorough understanding of the problems confronting the industry.

Structural Orders Near High for 1927

Washington, Nov. 22.—Bookings of fabricated structural steel in October totaled 229,033 tons, the second highest mark reached in over a year, according to the department of commerce. September new orders totaled 212,305 tons, those of October, 1926, 183,940 tons. Output was at 83 per cent of capacity in October. Further comparisons follow:

	Actual tonnage	Per cent of capacity	Computed tonnage	Shipments computed
Total 1925	.....	....	2,760,660	2,796,000
Oct.	183,940	64	203,520	251,220
Total (10 mo.)	.....	67	2,133,780	2,407,260
Nov.	177,198	61	193,980	222,600
Dec.	204,345	71	225,780	213,060
Total	.....	67	2,553,540	2,842,920
1927				
Jan.	155,978	54	171,720	174,900
Feb.	197,445	69	219,420	181,260
Mar.	186,388	66	209,880	200,340
Apr.	211,247	75	238,500	209,880
May	185,407	65	206,700	213,060
June	181,296	64	203,520	232,140
July	274,274	98	311,640	232,140
‡Aug.	218,420	76	241,680	260,760
§Sept.	208,242	76	241,680	248,040
†Oct.	229,033	83	263,940	232,140
(10 mos)	.....	73	2,311,860	2,187,840

‡Reported by 205 companies with a capacity of 281,845 tons.

§Reported by 200 firms with a capacity of 281,035 tons.

†Reported by 187 firms with a capacity of 277,080 tons.

Slag Is Extra Hard

Birmingham, Ala., Nov. 22.—Extra machinery is necessary to break the slag from the rebuilt No. 2 city furnace of the Sloss-Sheffield Steel & Iron Co. on account of the hardness of the slag. This class of slag is in demand for road building.

Connery Co., Philadelphia, steel plate manufacturer, has established group life insurance for its employes.

Pig Iron Looks Up

(*Concluded from Page* 1313)

shipped to fill orders taken west of Chicago. For first quarter and the bulk of spot orders, local furnaces are holding firmly to $18.50 for No. 2 foundry and malleable. Silvery sales are light. Only scattered charcoal iron orders are reported.

November sales of northern iron may prove the best in three months, according to sellers.

Cincinnati, Nov. 22.—A southern Ohio melter is inquiring for 600 tons of northern foundry iron for December-March delivery. The Standard Sanitary Mfg. Co. has not yet closed on 5000 tons for its Louisville, Ky., plant. The Belfont stack continues active. Prices are unchanged.

St. Louis. Nov. 22.—While shipments of pig iron continue liberal and exceed a month and a year ago, sales have not maintained the pace attained a week or ten days back. Melters are disposed to hold off, awaiting developments and the arrival of new orders for their products. Sales reported totaled about 2500 tons, of which the leading local producer disposed of 2000 tons. Bulk of the iron is for first quarter delivery. Relatively little inquiry is out. One is for 5000 tons from Standard Sanitary Mfg. Co. for its Louisville, Ky., plant. Prices remain unchanged.

Birmingham, Ala., Nov. 22.—Buying of pig iron in the aggregate is considerably greater than two months ago. Delivery is steady. First quarter inquiry continues but no base price has been announced and sales are not reported. Surplus stock is still large, though furnace interests believe that with a few weeks activity a large proportion of the tonnage can be moved. Furnace interests say the $16 on price for No. 2 foundry will be maintained on this year's delivery only.

Philadelphia, Nov. 22.—Certain under-cover transactions feature pig iron. These tonnages were placed by consumers who usually are shrewd judges of the market. Miscellaneous buying also has been better. It is estimated that the past week's business aggregated 25,000 to 30,000 tons in this territory. Prices generally are unchanged.

Illinois Employment Up in October

Chicago, Nov. 22.—October factory employment in Illinois has gained in nine of the 14 leading industrial centers, according to the monthly review of industrial conditions of the state department of labor. This increase in employment was 1.8 per cent. Reopening of coal mines and pickup in several of the metal groups helped to raise the employment total. Decreases were reported in iron and steel foundries, printing establishments, clothing factories, canning activities, and brick yards.

United States exported three electric railway cars in August, all to Portugal.

Sheet & Tube Drops Out of Merger Talk

Youngstown, O., Nov. 22.—Both industrial and financial circles in the district are alive with rumors of mergers, and on the strength of these the prices of various industrial shares have advanced from 3 to 10 points on the Cleveland exchange within the past several days. Most of the merger rumors center around Republic Iron & Steel Co., Trumbull Steel Co., Central Alloy Steel Corp. and Inland Steel Co., Chicago. In all of these Cyrus A. Eaton, of Cleveland, is believed to be financially interested. The name of the Youngstown Sheet & Tube Co. has been dropped from the local merger talk, and President John T. Harrington of Trumbull Steel Co. today denied officially there were any merger negotiations with the Sheet & Tube company and his company.

Some reports say that appraisals are being made in some of these plants, but this generally is not credited. It is thought this appraisal talk has become mixed with recent reports of appraisals being made of several of the smaller sheet plants here in negotiations pending with the Mansfield Sheet & Tin Plate Co. Now it is said this smaller merger project is off definitely, foundering on the appraisal rocks upon which it several times has gone shipwreck.

Sees Auto Buying Spurt Early in 1928

Chicago, Nov. 22.—Addressing members of the National Association of Finance Companies in Chicago last week, Milan V. Ayres, Chicago economist, declared that while the saturation point in automobile buying already has been reached, that fact need not cause automotive producers great concern.

Mr. Ayers estimated that the saturation point had been reached in 1923 when more than 20,000,000 cars were on the market. He also predicted that replacement demand, now figured at 3,140,000 cars yearly, will materially increase, or at least hold its own until 1932. He forecast that, owing to pent-up demand of those waiting to see the new Ford car, a rush of automobile buying will take place early in 1928.

New Pipe Mill Operating

New York, Nov. 22.—Bethlehem Steel Co. has just started the second unit of its buttwelded pipe department at Sparrows Point, Md., and expects to start the two lapwelded mills about Jan. 1.

Wickwire-Spencer Bond Committee Named

Boston, Nov. 22.—Looking to the protection of holders of the prior lien collateral and refunding mortgage 7 per cent sinking fund convertible gold bonds of the Wickwire-Spencer Steel Corp., a committee was appointed in this city last week, composed of George W. Treat, Frederick W. Allen, John E. Blunt, Thomas B. Gannett and Acosta Nichols. A circular mailed to bondholders by this committee reports that for the first nine months of this year earnings before interest on the funded debt and depreciation were $911,670, interest on the funded debt was $1,241,039, and depreciation was $312,231, leaving a deficit of $641,600. This compares with a deficit of $854,357 in the calendar year 1926 and one of $348,189 in 1925. The deficit for two years and three-quarters is $1,844,147.

Manufacturers of Power Transmission To Meet

The Power Transmission association will conduct its annual meeting at the Hotel Commodore, New York, Dec. 7, it has just been announced. A session to be held in the morning will be devoted to business of the organization while the afternoon session will give its attention to papers, reports and discussions. A merchandising advisory committee recently has been appointed and one of the main reports to be heard will be the recommendations of that group.

Among the papers to be read at the afternoon session are the following:

"What Can the Department of Commerce Do To Improve Domestic Sales and Conditions in Transmission Industries?" by W. H. Rastall, chief, industrial machinery division, department of commerce, Washington.

"Mechanical Power Transmission and the American Society of Mechanical Engineers," by W. L. Batt, president, S K F Industries, New York, and R. T. Kent, chairman, A. S. M. E. committee on professional divisions.

"Mechanical Power Transmission Economies," by William Staniar, belting and transmission engineer, E. I. duPont de Nemours & Co., Wilmington, Del.

"Possibilities of Applying Advantages of Simplified Practice to Belting and Other Power Transmission Industries," by R. M. Hudson, division of simplified practice, department of commerce, Washington.

September shipments of enameled sanitary ware totaled 372,599 pieces, compared with 413,065 pieces in August and 312,920 pieces in September, 1926.

October Auto Output Still on Drop

Washington, Nov. 22.—Automobile production in the United States in October continued its decline, totaling 221,292 passenger cars and trucks compared with 257,464 cars and trucks in September, according to the department of commerce. Canadian production also declined, totaling 7791 passenger cars and trucks in October, compared with 11,262 cars and trucks in September. Further comparisons follow:

	——United States——			(1) Canada
1926	Total	Passenger cars	Trucks	Total
January	300,612	272,922	27,690	15,479
February	354,432	319,763	34,669	18,838
March	422,728	381,116	41,612	22,374
April	430,523	383,907	46,616	21,502
May	417,214	373,140	44,074	24,934
June	380,372	339,570	40,802	21,751
July	354,394	317,006	37,388	15,208
August	422,294	380,282	42,012	15,261
September	393,357	350,923	42,434	17,495
October	329,142	289,565	39,577	14,670
(9 mos.)	3,805,068	3,408,194	396,874	187,512
November	250,950	219,504	31,446	9,828
December	163,429	137,361	26,068	7,752
Total	4,219,449	3,765,059	454,390	205,092
1927				
January	234,231	196,989	37,242	15,376
February	298,765	260,644	38,121	18,655
March	386,841	341,676	45,165	23,250
April	397,780	353,223	44,557	24,611
May	395,674	352,428	43,246	25,708
June	313,584	273,718	39,866	18,208
July	263,239	233,384	29,855	10,987
(2) August	304,045	271,943	32,102	12,526
(2) Sept.	*257,464	*224,859	*32,605	11,262
(2) October	221,292	185,706	35,586	7,791
(9 mos.)	3,072,915	2,694,570	378,345	169,374

(1) Reported by Dominion Bureau of Statistics since January, 1926.
*Revised.
(2) United States totals for National Automobile Chamber of Commerce members only.

Dumping Act May Be Void Against Germany

Washington, Nov. 22.—The opinion asked by the treasury department from the attorney general whether issuance of a dumping order on steel products from Germany would affect our commercial treaty with Germany may lead to many complications. If the attorney general should find that the order could not be issued under the treaty, it would mean that our dumping act insofar as Germany is concerned is void. This might apply as a precedent for other countries. Many dumping orders have been issued by the United States government against Germany since the commercial treaty was entered into, and this is the first time that the German government has taken up this point.

Chase Brass & Copper Co., Waterbury, Conn., has established a distributing office at 429 Camp street, New Orleans.

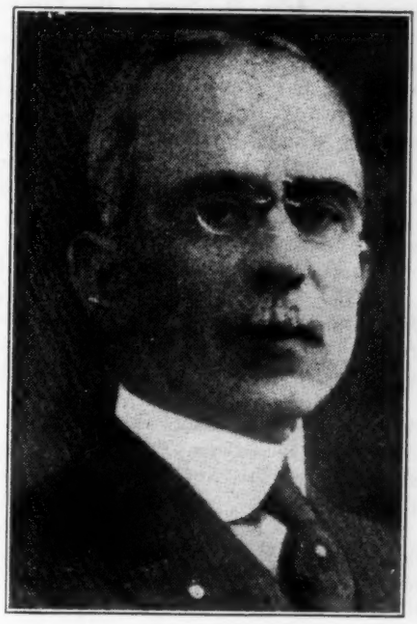
Industrial Men in the Day's News

John G. Jennings, For 45 Years a Manufacturer of Bolts and Nuts

DURING his 45-year career in the bolt and nut industry he has been with but one company, in which he has held numerous positions from bookkeeper to president.

HE HAS been an active worker for civic and welfare advancement and has served in the capacity of trustee for several philanthropic organizations.

AN ACCOMPLISHED musician, music is one of his recreations and might be termed his hobby. Golf and study of modern languages also are diversions from business.



JOHN G. JENNINGS, president of Lamson & Sessions Co., Cleveland, last month entered his forty-fifth year as a manufacturer of bolts and nuts. Joining the Lamson & Sessions Co. in October, 1883, as a bookkeeper, he has spent his entire industrial career since then as a member of the same organization, being advanced steadily through different departments and positions until he became the executive head of the company. Lamson & Sessions Co., through a recent merger with the Kirk-Latty Mfg. Co., Cleveland, and through internal expansion, has grown to a prominent place in the bolt and nut industry of the country. In addition to operating the former Kirk-Latty plant in Cleveland, the Lamson & Sessions Co. operates a plant at Kent, O., formerly the Falls Rivet Co.

Mr. Jennings was born Sept. 28, 1856, at Cleveland. Following his education in the public schools of Cleveland he entered Yale university, New Haven, Conn. He obtained a bachelor of arts degree from Yale in 1878 and shortly afterward entered the employ of Wilcox, Treadway & Co., Cleveland, as a bookkeeper. He remained with that company for five years before affiliating with Lamson & Sessions in a similar capacity. In addition to being president of the Lamson & Sessions Co., Mr. Jennings is a director of Johnston & Jennings Co., Cleveland, manufacturer of traveling cranes, steel forgings, etc. He is a director also of the Union Mortgage Co., Cleveland. Some of his recreation is obtained in the form of golf. He is a member of the Union, Shaker Heights Country, Westwood Country and Clifton clubs and the chamber of commerce, Cleveland, and of the Thousand Island Country club, Alexandria Bay, N. Y. Mr. Jennings is a trustee of the Riverside Cemetery association, of the Jones Home for Friendless Children and of the City Mission. He has been active for years in civic, welfare and philanthropic work.

Music might rightfully be termed his hobby. Mr. Jennings is an accomplished musician as well as a lover of good music. He is proficient in playing the flute and saxophone and at times has played in orchestras. The study of modern languages ranks second in his hobbies. Mr. Jennings speaks French, German and Spanish fluently and is a member of the Polyglot club in which the members speak a different language at each luncheon meeting.

Mr. Jennings is the father of I. L. Jennings, vice president and director of sales of the Lamson & Sessions Co. He maintains his residence at 2920 Broxton road, Shaker Heights, and a summer home at 17862 Lake avenue, Clifton Park, Cleveland, as well as a summer home at Thousand Islands, Alexandria Bay, N. Y.

Men of Industry

Personal News of a Business Character Pertaining to the Iron and Steel and Related Fields of Enterprise

A. J. HAZLETT, sales manager of the Eastern Rolling Mill Co., Baltimore, has been elected president, succeeding John M. Jones, who died Nov. 1.

Charles E. F. Clarke, a vice president of the company, has been elected chairman of the board, C. A. Pennock, vice president and general manager, and L. J. Jones, vice president, in addition to his present position of secretary. J. A. Downey, formerly treasurer, is now vice president and treasurer.

* * *

Don D. Grussing has been made sales manager of the Northfield Iron Co., Northfield, Minn.

* * *

Charles M. Schwab, chairman of Bethlehem Steel Co., Bethlehem, Pa., has been elected a trustee of the American Surety Co.

* * *

R. P. Nick has been transferred from the Baltimore office of the Lincoln Electric Co., Cleveland, manufacturer of motors and welders, to the office at Lancaster, Pa.

* * *

A. L. Martin, formerly general sales manager, General Tire & Rubber Co., Akron, O., has been appointed general sales manager of the Vlchek Tool Co., Cleveland.

* * *

C. F. Atwood and F. A. Bottome have been appointed special representatives in New England territory of the Poldi Steel Corp. of America, New York.

* * *

Fred H. Diehl, purchasing agent of the Ford Motor Co., Detroit, and with the company for nearly 20 years has resigned and is succeeded by A. M. Wible, of the engineering department.

* * *

L. D. Brueckel has been appointed general manager of sales of the strip steel department of the Weirton Steel Co., Weirton, W. Va., succeeding Harry C. Smith, who died recently.

* * *

A. C. Scully has been made treasurer of Ryan, Scully & Co., Philadelphia, industrial heating engineers. He was for 15 years treasurer of the Lancaster Iron Works, Lancaster, Pa. Previous to that Mr. Scully had been with the Scully Steel & Iron Co., Chicago, which was headed by his father. He has been connected with the furnace industry since 1910.

* * *

G. C. Barry, assistant to the vice president in charge of sales of the American Brown Boveri Electric Corp., New York, has resigned to become associated with the Arrow Electric Co., Hartford, Conn.

* * *

Thomas Arthur, away from his desk at Hickman, Williams & Co., Pittsburgh, for the past ten months, has resumed his executive duties as vice president and director, having regained his health.

* * *

F. H. Wilcox, vice president of Freyn Engineering Co., Chicago, has just returned from a three-month trip in Europe, where he visited Belgium, France, Germany, Luxemburg and England.

* * *

W. R. DeHart has resigned from the Aztec Machine & Supply Co., Aztec, N. M., dealer and jobber in oil field equipment, and is succeeded by E. B. Deason. M. F. Gorey joined the company Nov. 1.

* * *

Alfred L. Carlson, formerly with the Gisholt Machine Co., Madison, Wis., Otis Elevator Co., and Henry Prentiss Co. both of New York has been made sales engineer in the eastern territory of the Giddings & Lewis Machine Tool Co., Fond du Lac, Wis., with his headquarters in New York.

* * *

Walter Robbins has been elected president of the newly-organized General Cable Corp., Pittsburgh. Joseph N. Marsh, chairman of the board of directors, formerly was president of the Standard Underground Cable Co. one of the companies merged into the General Cable Corp. F. H. Brownell, of the American Smelting & Refining Co. is chairman of the executive committee.

* * *

H. W. How, formerly chief engineer of the Buffalo Foundry & Machine Co., Buffalo, has been made consulting engineer of the Struthers-Wells Co., steel plate fabricators, Warren, Pa. Before the war Mr. How was in charge of the machine and plate shop of the Thomas C. Basehor Co., of Florida, and later with the Southern Menhaden Co., Jacksonville, Fla. He had been with the Buffalo Foundry & Machine Co. for the past five years.

* * *

H. G. Perkins has been made assistant works manager of the Murray Corp. of America, Detroit, builder of auto bodies. For the past six years Mr. Perkins had been industrial engineer with the Chrysler Corp., Detroit.

W. T. Schmitt has been elected secretary and treasurer of the Murray corporation, succeeding F. R. Robinson, who resigned recently. Prior to this election he was comptroller.

* * *

W. D. Coolidge, assistant director of the research laboratory of the General Electric Co., Schnectady, N. Y. has been awarded the Hughes medal by the Royal society for "distinguished work on X-rays and the development of highly efficient apparatus for their production." The Hughes medal was first presented in 1913 to Dr. Alexander Graham Bell. Dr. Irving Langmuir, also of the General Electric research laboratory, received it in 1918.

* * *

Charles E. F. Clarke, vice president of the Baltimore Tube Co., Baltimore, has been elected chairman succeeding John M. Jones, whose death was announced in IRON TRADE REVIEW, issue of Nov. 10.

C. S. Inglis, treasurer of the Tube company, was retained in that position, in addition to being elected president, also in succession to Mr. Jones.

R. S. Stringer, M. J. Callanan and E. G. James have been elected vice presidents of the Tube company Mr. James is also the secretary of the company.

* * *

Elmore S. Pettijohn, who has been made director of research of the Michigan Gas association with headquarters at Ann Arbor, Mich., is a graduate of the University of Michigan of that city, with the class of 1918. He has been with the Semet-Solvay Corp. and the Ford Motor Co., re-entering the university to obtain

(*Concluded on Page* 1334)

Founders Air Internal Problems

Speakers at Thirty-First Annual Convention of National Founders Association Deal with Competition, Labor, Accounting and General Business Conditions—Custer Visions Foundry of Future

THE largest attendance in several years combined with a well-rounded program made the thirty-first annual convention of the National Founders association in New York last week a meeting of unusual success. More than 225 were registered, and the discussion, carefully planned, went exhaustively into such subjects as the open shop, industrial training and personnel work, politics in its application to the industry and business generally, cost accounting and various other matters of unusual current interest to foundrymen.

Members came to the meeting in a receptive mood. The industry generally had been through some rather lean months, with no sharp improvement in early prospect, and the attentiveness with which members followed remarks of the speakers was pronounced. Special interest was paid to E. A. Custer, Jr., Philadelphia, who spoke on the future of the gray iron foundry industry and to E. T. Runge, Cleveland, who enumerated various causes for losses in the foundry industry.

Report by L. D. Olson, committee chairman, indicated substantial progress in the associations of apprentice and industrial education program, and that association members were remarkably free from labor trouble during the year was indicated by A. E. McClintock, Chicago, association commissioner, who declared there had been only one strike, involving 31 molders.

C. S. Koch, of the Fort Pitt Steel Casting Co., McKeesport, Pa., was elected vice president to succeed W. A. Griswold, of Nashville, Tenn. William H. Barr, Buffalo, continues as president; A. E. McClintock, as commissioner; J. M. Taylor, Chicago, secretary; and Chicago Trust Co., Treasurer.

The annual banquet was featured by an address by Charles Milton Newcomb, Independence, O., entitled "The Psychology of Laughter." James A. Emery, association counsel, was toastmaster.

Foundrymen Seek Remedies for Business Ills

IN HIS opening address President Barr urged constant vigilance and practical support of manufacturers in combating unionism. He condemned as a fallacy the belief of many well meaning persons that trade unionism is a tower of strength against communistic ideals in this country. He suggested as a measure for combating the communistic movement that closer watch be kept by members in their local communities and urged that they take a definite and nonpartisan interest in local politics.

President Barr paid strong tribute to the late Elbert H. Gary. He praised his qualities of leadership, and characterized him as one of the greatest figures to have appeared in American industrial life.

Referring to the foundry industry as one which has suffered more in competition with other industries than any one basic industry, the speaker urged that foundrymen undertake industrial research and advertising from a national standpoint for the purpose of extending markets. He suggested that the industry, through carefully selected committee, make an effort to discover new uses for foundry products and new products for the foundry. A resolution passed later provided for the appointment of this committee.

President Barr stated the belief that this committee should in no way duplicate the work of research technicians but rather by its work stimulate that of the technicians through a co-operation of national interest. He thought that steps should be taken to acquaint the purchasing public with the particular advantages of foundry products.

An interesting speaker and one not on the program was S. W. Utley, president of the American Foundrymen's association and a member of the National Founder's association. Comparing the two organizations to two high-powered engines running along parallel tracks and likely on occasion to sideswipe each other, he defined his conception of the objectives of the two associations.

He described the organization of the navy, with the commander of a battleship confining his attentions to personnel work and the lieutenant commander to materials and equipment. Mr. Utley likened this organization to that in the foundry industry, with National Founders, broadly speaking, devoting their activities to personnel matters and the American Foundrymen to materials and methods.

In a brilliant address, James A. Emery brought out contrasting tendencies in the labor movement in this country and in England and several other European countries as well. He compared the strong legislative reaction to excessive trade union privileges in England to the tendency toward greater liberality in legislative power to trade unions in this country.

By a recent act, Mr. Emery said, the British Parliament has not only followed what is generally known as the American plan, but has clamped restrictions on British labor unionism far more rigid than in this country. He enumerated the more important of these restrictions.

Commissioner McClintock reported an interesting situation that has developed in the stove industry. Stove manufacturers in the South, he said, have been very largely on an open shop basis. The closed shop stove manufacturers of the North, however, for more than 30 years have been entering into annual agreements with the molders union, with a result that the introduction of molding machines and improved methods in their foundry departments has been greatly retarded. He said this difference in methods due to labor influence has placed the closed shop stovemakers at a decided disadvantage.

The commissioner reported that the molders union now has a paid membership of approximately 27,500. He enumerated briefly several develop-

ments at the annual convention of the American Federation of Labor in Los Angeles this fall which impressed him particularly. One was the adoption of a resolution in favor of continuing the organizing work in the automobile industry until it is thoroughly unionized; and another was the recommendation to promote organization of mechanics in the aviation industry, as the opinion was expressed that the men employed in that service could be doubled or tripled within a year.

Still another was the passage of a resolution declaring in favor of the membership of the negro in all unions on exactly the same terms as white men. New York and Michigan delegates protested by resolution against Canadian immigration, particularly the practice of Canadian residents working in Detroit, Buffalo, and border cities and returning to Canada at night. The 5-day week was again approved as a goal for which union labor is striving. Commissioner McClintock also mentioned a resolution recommending legislation to define and limit the equity power of courts and to amend the anti-trust or anti-combination laws.

Of more than 200,000 manufacturing companies throughout the country, 80 per cent operate at a loss. Ten per cent operate with a profit of more than $5000 and similar per per cent with a profit of less. These were the precluding remarks of E. T. Runge in an address on the subject of cost accounting in the foundry.

He enumerated several reasons why foundries operate at a loss. One, he said, is the quoting of castings on a freight allowed to customers plant basis instead of on the basis of f.o.b. cars. Another is to be found in the cash discount allowed to customers, which he said amounts to a dividend allowance to the customers in many cases of around 24 per cent per annum. A third reason lies in the castings returned to the customers and not allowed for in the compilation of costs.

The figure used in estimating molding and labor was often a source of leakage. He cited as an example the foundry—one of many—who figured its molding cost on a 9-hour day when the actual time for molding was about 7½ hours. Assuming that the cost figured on the 9-hour basis was 80 cents, he said that it would be obvious that the real cost, figured on the 7½-hour basis, was $1 or difference of 20 cents. This, he said, extended to the overhead, might amount to an added cost of 200 per cent or another 40 cents, making for a total in all of 60 cents. If the casting is a 60-pound casting, this would amount to a matter of one cent per pound aside from all other items of cost.

Mr. Runge said that 90 per cent of the foundries either figure cost on an average price per pound or have no cost system at all, and that it is therefore necessary to divide foundries for cost accounting purposes into at least four departments, namely, melting, molding, cleaning and coremaking.

Mr. Runge declared the normal capacity rate of the gray iron foundry should now be around 67 per cent; for the malleable foundry 65 per cent; and for the brass, 70 per cent. Prior to the war, normal capacity was generally considered as being around 80 per cent.

E. A. Custer, Jr., Philadelphia, expressed his belief that the gray iron foundry industry is facing a new era in which many now undeveloped potentialities in iron castings will be recognized. His address is abstracted on page 1294 of this issue.

Depicting the progress in the associations apprenticeship training program, L. W. Olsen, committee chairman, asserted that there are now approximately 577 apprentices in 30 centers which have reported, as compared with 196 apprentices in 13 centers in 1925. Six of these 13 centers co-operated with the public school. At present, 19 of the 30 centers are co-operating with public schools.

He stated that 82 schools and colleges are now offering foundry courses or giving some foundry instruction to 3147 students. This number compares with 2803 foundry students last year while the number of schools and colleges giving instruction have increased by 18.

Mr. Olsen asserted something should be done to bring the average foundryman and foreman out of the rut of mere sand pounding to an understanding of their metallurgical responsibilities and achievements. Other industries, he said, had been developed in proportion to their appreciation of the scientific possibilities of their processing.

Other speakers included General R. C. Marshall, Jr., general manager of the Associated Contractors of America, Inc., Washington, who pointed to the evils of government participation in business. He cited various instances of waste and extravagance and in many cases to a general lack of efficiency. Honorable George Gordon Battle, New York, spoke of the advantages of co-operation between the association and the Better Business bureaus for the protection of the investing public. He said that $2,000,000,000 annually was lost in fraudulent investment.

Col. William Frew Long, general manager of the American Plan association, spoke interestingly on how closed shop in the building industry effects open shop conditions in other industries. He illustrated certain of his remarks with latern slides, showing acts of vandalism and lawlessness which he attributed to building trades union in many of the larger cities. The aims and functions of the educational department of the National Founders association were most capably presented by L. A. Hartley, director of industrial education for the association.

A resolution was passed calling for the appointment of a committee for the further stimulation of study in cost accounting, while another was presented, for action later, on an amendment to the association's constitution. A resolution was also passed upon the recent death of Carleton A. Chase, son of the founder of the Syracuse Chilled Plow Co.

Committeemen for the seven districts of the association follow:

First District

H. L. Steeves, Rhode Island Malleable Iron Works, Hillsgrove, R. I.; Nelson J. Darling, General Electric Co., West Lynn, Mass.; Alfred E. Hammer, Malleable Iron Fittings Co., Branford, Conn.; H. W. Hosford, Norwood Engineering Co., Florence, Mass.; and Carl S. Neumann, Union Mfg. Co., New Britain, Conn.

Second District

C. W. Noble, Noble & Wood Machine Co., Hoosick Falls, N. Y.; J. L. Lonergan, Morris Machine Works, Baldwinsville, N. Y.; A. S. Macdonald, Sneed & Co., Jersey City, N. J.; E. O. Duesing, McIntosh & Seymour Corp., Auburn, N. Y.; and William E. Van Horn, Otis Elevator Co., Buffalo.

Third District

Thomas W. Pangborn, Pangborn Corp., Hagerstown, Md.; C. H. Hoffstetter, Odin Stove Mfg. Co., Erie, Pa.; T. B. Wood, T. B. Wood's Sons Co., Chambersburg, Pa.; G. L. Coppage, Pusey & Jones Corp., Wilmington, Del.; and B. H. Johnson, Gresson-Morris Co., Philadelphia.

Fourth District

R. J. Redmond, Buckeye Foundry Co., Cincinnati; Wm. D. Hamerstadt, Rockwood Mfg. Co., Indianapolis; W. L. Seelbach, Walworth Run Foundry Co., Cleveland; E. S. Van Dalson, Dodge Brothers Inc., Detroit; and J. Edgar Lee, Challenge Machinery Co., Grand Haven, Mich.

Fifth District

W. G. Jones, W. A. Jones Foundry & Machine Co., Chicago; Walter R. Medart, Medart Co., St. Louis; C. N. Stone, Deere & Co., Moline, Ill.; A. J. Hartley, Hart Grain Weigher Co., Peoria, Ill.; and J. W. Bettendorf, Bettendorf Co., Bettendorf, Iowa.

Sixth District

Emil Vilter, The Vilter Mfg. Co., Milwaukee; F. H. Clausen, Van Brunt Mfg. Co., Horicon, Wis.; R. P. Tell, National Brake & Electric Co., Milwaukee; C. S. Anderson, Belle City Malleable Iron Co., Racine, Wis.; and Fred S. Power, St. Paul Foundry Co., St. Paul.

Seventh District

W. F. Tynes, Hardie-Tynes Mfg. Co., Birmingham, Ala.; D. B. Dimick, American Casting Co., Birmingham, Ala.; A. E. Hartwell, Hartwell Iron Works, Houston, Texas; A. C. Jones, H. Wetter Mfg. Co., South Pittsburg, Tenn.; and Charles R. Law, De Soto Foundry & Machine Co. Ltd., Mansfield, La.

Honorary Member of Administrative Council

O. P. Briggs, Minneapolis.

Here and There in Industry

Live Information Which Records the Expansion of Various Lines of Productive Enterprise

RYAN, SCULLY & CO. is the new name adopted by F. J. Ryan & Co., Philadelphia, industrial heating engineers. The change is made because of the decision of A. C. Scully to become more closely identified with the company, in which he has been interested for a number of years.

* * *

ACME SPRINKLER CO. has removed its Chicago offices to 173 West Madison street, rooms 1105-07.

* * *

AMERICAN STEEL CO. OF INDIANA, Terre Haute, Ind., organized about a year ago to operate a new steel rolling mill on South Thirteenth street, Terre Haute, will not reopen its mill until spring on account of market conditions.

* * *

MATHIESON ALKALI WORKS INC., New York, manufacturer of heavy chemicals, has bought the ammonia business of the B. P. Clapp Ammonia Co., with offices in Cincinnati, Louisville, Ky., Washington and Providence, R. I.

* * *

AMERICAN RADIATOR Co., New York, has negotiations under way for absorbing the American Blower Co., Detroit, manufacturer of fans, blowers and heating apparatus. A new company, American Blower Corp., will be formed to operate the plant.

* * *

BLAW-KNOX CO., Pittsburgh, has appointed the following distributors of its open flooring, grating and steps: Worden-Allen Co., Milwaukee; Wilson-Weesner-Wilkinson Co., Knoxville, Tenn.; James A. Hall, 1525 Esperson building, Houston, Tex.

* * *

NORTHERN BLOWER CO., Cleveland, has taken contracts to install complete dust-collecting equipment in the plant of the Lawrence Portland Cement Co., Northampton, Pa., and the Volunteer Portland Cement Co., Knoxville, Tenn.

* * *

MULLINS BODY CORP., Salem, O., has changed its name to Mullins Mfg. Corp., better to indicate its activities. Formerly manufacturing automobile bodies, the company now produces automotive parts, stampings, boats and steel tubs for washing machines.

* * *

BEHNKE & JENSEN, Royalton, Wis., has added an aluminum foundry to its plant. The company manufactures vacuum pumps and tanks, pulsators, pail lids and handles for milking machines. It plans to manufacture complete milking machines.

* * *

LINK-BELT LTD., Toronto, Ont., has completed a modern plant for the manufacture of elevating, conveying and transmission machinery. The company also has bought the plant of the Elmira Machinery & Transmission Co., Elmira, Ont. Link-Belt Ltd. now controls 11 plants and 16 warehouses and has 37 offices.

* * *

BOSTON & MAINE railroad has awarded to Dwight P. Robinson & Co., New York, construction work involved in an improvement program at North Station, Boston. This includes a new station and, in connection, a coliseum which will be leased to Madison Square Garden Corp., of New York.

* * *

EATON, RHODES & CO., Cincinnati, pig iron brokers, have reconsidered their decision to abandon their office in Pittsburgh. The company will be represented by J. G. Walton, who has been manager of the office there for many years. He will be at 1630 Oliver building. Requests by the trade at Pittsburgh caused the company to continue the representation.

* * *

NATIONAL TUBE CO. has placed a contract with the Chapman-Stein Furnace Co., Mt. Vernon, O., for a recuperative tube reheating furnace at its works at Lorain, O. The furnace will be 40 feet long, 13 feet wide outside the brickwork, and will have capacity of 45 tons per hour. It will be built to handle pipe 5 to 11 inches in diameter and 32 feet long.

* * *

MIDWESTERN TOOL CO., Chicago, has moved into its new plant at 2811-2823 North Ashland avenue, where better facilities are available. A specialty is being made of milling cutters and gear and thread hobbers. Machinery for the automotive trade will be manufactured next year. S. R. Swenson is president and treasurer, Ben Bertsen vice president, and E. R. Klemme secretary.

* * *

PITTSBURGH TOOL STEEL WIRE CO., Monaca Pa., is celebrating its silver anniversary this year. Ralph H. Pauley is secretary-treasurer.

* * *

LOCKWOOD, GREENE & CO. INC., Boston, industrial engineers, have decided to concentrate their engineering forces by closing their offices in Cleveland and Detroit, serving these fields from the office in Chicago. Charles G. Atkin of the Cleveland office, and Dan Adams of the Detroit office, will continue to represent the company in western territory, with headquarters in Chicago.

* * *

HARBISON-WALKER REFRACTORIES CO., Pittsburgh, has let contracts for four direct-fired tunnel kilns, of identical type and size, two to be erected at its plant at Templeton, Pa., and two at Clearfield, Pa. They will be used for burning fireclay brick only. Each kiln will be 444 feet long and have a daily capacity of 35,000 9-inch brick. The kilns were designed by the American Dressler Tunnel Kilns Inc., Cleveland, and will be built by William Swindell & Bros., Pittsburgh, an associate company. Cost of these kilns, including buildings and equipment, will be about $1,300,000.

* * *

FORD MOTOR Co. has closed a contract with the H. K. Ferguson Co., Cleveland, for a plant at Koyasu, a suburb of Yokohama, Japan, with capacity of 200 cars a day. It will be used for assembly of Ford and Lincoln cars. It is to be completed and equipped by August, 1928. It will be 300 x 480 feet, with sawtooth and insulated roof. Earthquake and fire-resisting construction worked out by Ferguson engineers, will be embodied in its construction. Purchase of the site is one of the first

(*Concluded on Page* 1338)

Obituaries

FREDERICK F. FITZPATRICK, 61, president of the American Locomotive Co., New York, died Nov. 16 at his home in Larchmont, N. Y. Mr. Fitzpatrick a native of Peterboro, Ont., was brought to the United States as a boy and educated in the public schools of Chillicothe, Mo. At 15 he went to work as a Western Union telegraph operator in Kansas City. In 1886 he entered the executive employ of the Missouri Pacific railroad and later became St. Louis representative of the Charles Scott Spring Co., which merged with the Railway Steel Spring Co. in 1902. He became general sales agent for the Railway Spring company in 1906 advancing through the vice presidency to become president in 1910, an office which he held up to the time of his election as president of the American Locomotive Co., in 1926. Mr. Fitzpatrick was also president of the Montreal Locomotive Works, the Canadian Steel Tire & Wheel Co. and the American Locomotive Sales Corp., and vice president of the Railway Business association. He was a director in the American Car & Foundry Co., the Safety Car Heating & Lighting Co., and other companies.

* * *

Gottlieb C. Dellenbach, 81, chairman of the board of directors of the Fort Pitt Bridge Works, Pittsburgh, died Nov. 13.

* * *

Burt Hicks, 70, proprietor of a machine and repair shop in Portland, Oreg., died at his home in that city recently. He was born in Jefferson, N. H., going to Portland in 1882 and had been in the iron and steel industry since that time.

* * *

Freeman H. Palmer, 45, vice president and general manager of the Niagara Metal Weather Strip Co., Buffalo, died at his home in that city recently. He went to Buffalo 20 years ago from Ogdensburg, N. Y., where he was born, and founded the Weatherstrip company.

* * *

Frederick Haberman, 80, formerly a manufacturer of enameled wares, died at Miami, Fla., Nov. 15. He came to America from Germany and started in business as a tinsmith, later helping to found the National Enameling & Stamping Co., New York, of which he was vice president. He also founded the Haberman Mfg. Co., with a plant at Haberman, L. I. He retired from active business about 20 years ago.

* * *

Edward Hubbard Wells, 68, chairman of the board of directors of Babcock & Wilcox Co., New York, maker of tubular boilers, died Nov. 17 at Montclair, N. J. Mr. Wells was born in Dorrville, R. I., and had lived at Montclair for the last 25 years. He joined the Babcock & Wilcox Co. as engineer in charge of sales in 1892, becoming president six years later. He was made chairman of the board in 1919. Mr. Wells was a director of the Worthington Pump & Machinery Corp., New York, and other organizations.

* * *

Samuel J. Fields, 83, at one time chief engineer of the Pan-American exposition, and associate engineer of the St. Louis exposition, died Nov. 19 at his home in Buffalo. He had been resident engineer for the New York Central railroad, and later was a member of its bridge building department. Mr. Fields was at various times engineer of the Buffalo Bridge works, Buffalo city engineer, and supervising engineer of the Buffalo water works. He was a graduate of Rensselaer Polytechnic institute, Troy, N. Y.

* * *

Carleton A. Chase, 63, Syracuse, N. Y., for many years identified with the metalworking industry, and who died in Philadelphia, Nov. 16, was the son of the founder of the Syracuse Chilled Plow Co., now the John Deere Co. He joined the company shortly after leaving school, becoming vice president in 1902 and president some years later, resigning in 1920 to become president of the First Trust & Deposit Co., Syracuse. He was active in the National Association of Manufacturers and the National Founders' association, serving at one time as vice president in both organizations, and for a number of years was a member of the National Industrial Conference board.

* * *

Henry G. Steinbrenner, 59, formerly vice president of the Industrial Brown Hoist Corp., Cleveland, crane and hoist manufacturer, died Nov. 16 in Chicago. He had been second vice president in charge of marketing for the Brown Hoisting Machinery Co. prior to its merger with the Industrial Works, Bay City, Mich. Before his connection with the Hoisting Machinery company, Mr. Steinbrenner had been works manager of the Interstate Engineering Co., Cleveland, later the McMyler-Interstate Co.; he was a partner of the Orton-Steinbrenner Co., now the Orton Crane & Shovel Co., Chicago, leaving it in 1923 to become associated with the Burdick Tire Co., Noblesville, Ind., of which he was made president. He later directed its reorganization into the Steinbrenner Rubber Co., of which he was the head.

Men of Industry

(*Concluded from Page* 1330)

his master's degree. He was employed by the Illinois Steel Co. and later by the Chicago By-Products Coke Co. both of Chicago. He left the latter place to assume his present position.

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J. J. Morsman has been elected president of the Carter White Lead Co., Chicago, succeeding F. M. Carter who has been made a vice president of the National Lead Co., New York.

* * *

H. M. Brown has been appointed purchasing agent of the Eastern Malleable Iron Co., Naugatuck, Conn., succeeding J. L. Linsley, who has been transferred to other duties with that company.

* * *

Clifford R. Babson, formerly director of sales of the United States Cartridge Co., New York, has resigned to become general sales manager of the Winchester Repeating Arms Co., with headquarters at New Haven, Conn.

* * *

H. A. Brown has been appointed vice president and general manager of General Motors of Canada, Oshawa, Ont., in succession to Gordon Lefebve, who has been made a vice president of the Oakland Motor Car Co., Pontiac, Mich., as announced in IRON TRADE REVIEW issue of Nov. 3.

* * *

David F. Geissinger, for many years identified with Somers, Fitler & Todd, Pittsburgh, in the sale of machine tools, has resigned to establish himself as a special representative in that district for the sale of machine tools and equipment, with his office at 602 Oliver building. He is factory representative of Sundstrand Machine Tool Co. and Barnes Drill Co., both of Rockford, Ill.

Iron Demand Is Off in Britain

Activity at Foundries Is Higher Than Buying of Iron Indicates—British Steel Producers Benefit as Delivery of Foreign Material Lags—Low Galvanized Sheet Prices Cut Production—Paris Is Talking Higher Steel Prices

European Headquarters,
IRON TRADE REVIEW,
Caxton House, Westminster, S. W.1

LONDON, Nov. 22.—Demand for pig iron has slumped and exports are dull. Iron and steel foundries are fairly busy.

The situation in steel is largely unchanged. Long delay encountered in getting delivery on foreign steel commodities is a factor favoring steel manufacturers in Great Britain.

Some warehouses are stocking foreign steel. Galvanized sheets are further depressed, with some sheet mills closing owing to unremunerative prices. The situation in tin plate is better owing to orders from the Continent and the Far East.

Berlin reports are that German steel mills are busy but have fewer new orders. Exports of plates and hoops are fair.

From Brussels comes word that improvement continues and prices are firm.

Prospects of higher steel prices are rumored at Paris.

British Steel Trade Shows Some Improvement

Office of IRON TRADE REVIEW,
Prince's Chambers, Corporation St.

BIRMINGHAM, Eng., Nov. 11.—(*European Staff Service*)—The steel trade is showing signs of revival. Firms in Sheffield who have lacked specifications for several months have had a rush this week which has involved embarassment as to the customers who shall first receive supplies. As a rule, the principle is maintained of small orders for quick deliveries, but there is general agreement that this has increased the aggregate of business.

A few good orders have been placed by the railways. The London, Midland & Scottish, whose rolling stock is inadequate, have decided to build and to distribute among private firms

Sterling $4.87

orders for over 8000 wagons. Locomotive orders have been numerous lately, the latest being an order for nine tank locomotives.

The pig iron industry is quiet. Urgent demands have been satisfied, and smelters have found it impossible to recover the small advance made last month. Consumption, however, has been large enough to absorb nearly all the output of Cleveland, and export business there is well maintained. Stocks are understood to be low, but it is likely that furnaces at work will prove ample for all requirements for some time. So far furnacemen have been uninfluenced by the appeal of home consumers to be placed on the same price footing as the foreign buyer, and the extra 2s 6d ($0.60) for home consumption is still charged. Business has been active at Barrow, fully absorbing the output of the thirteen furnaces working in the Lancashire and Cumberland area. Demand and supply are about balanced, but the furnacemen build their hopes on some expansion in the new year. All the steel districts are taking good quantities of low phosphorus iron and America and Japan have been more active buyers. Ferromanganese is decidely dull. The poorest demand for pig iron is in the Scotch district, where it is impossible to dispose of the output of the 32 working fur-

Current Iron and Steel Prices of Europe

Dollars at Rates of Exchange, November 21	*British* Gross Tons U. K. Ports		*French* Metric Tons Channel Ports		*Belgium and Luxemburg* Metric Tons Channel Ports		*German* Metric Tons Rotterdam or North Sea Port	
Export Prices f. o. b. Ship at Port of Dispatch—By Cable								
PIG IRON		£ s d		£ s d		£ s d		£ s d
Foundry No. 3, Silicon 2.50-3.00	$15.83	3 5 0*	$14.61	3 0 0	$14.61	3 0 0	$14.61	3 0 0
Basic	.....	.....	14.61	3 0 0	14.61	3 0 0	14.61	3 0 0
Basic-bessemer	17.65	3 12 6†	13.88	2 17 0	13.88	2 17 0	14.61	3 0 0
Hematite, Phosphorus 0.02-0.05	17.41	3 11 6	21.81	555*	.....	.....	17.05	3 10 0
SEMIFINISHED STEEL								
Billets	$28.00	5 15 0	$20.70	4 5 0	$20.70	4 5 0	$21.18	4 7 0
Wire rods	47.48	9 15 0	26.79	5 10 0	26.79	5 10 0	26.79	5 10 0
FINISHED STEEL								
Standard rails	$37.74	7 15 0	$31.05	6 7 6	$31.05	6 7 6	$31.05	6 7 6
Merchant bars	1.58c	7 5 0	1.06c	4 16 0	1.06c	4 16 0	1.05c	4 15 0
Structural shapes	1.55c	7 2 6	1.00c	4 8 0	1.00c	4 8 0	1.01c	4 12 0
Plates, ship, bridge and tank	1.71c	7 17 6	1.32c	6 0 0	1.31c	5 19 0	1.49c	6 15 0
Sheets, black, 24 gage	2.39c	11 0 0	2.12c	9 12 6	2.12c	9 12 6	2.86c	13 0 0
Sheets, galvanized, 24 gage, corrugated	2.93c	13 10 0	3.96c	18 0 0	3.25c	14 15 6	3.74c	17 0 0
Bands and strips	2.28c	10 10 0	1.21c	5 10 0	1.21c	5 10 0	1.49c	6 15 0
Plain wire, base	2.12c	9 15 0	1.49c	6 15 0	1.49c	6 15 0	1.60c	7 5 0
Galvanized wire, base	3.04c	14 0 0	1.93c	8 15 0	1.93c	8 15 0	2.09c	9 10 0
Wire nails, base	2.83c	13 0 0	1.60c	7 5 0	1.65c	7 10 0	1.76c	8 0 0
Tin plate, base box 108 pounds	$ 4.32	0 17 9	.....	.....	.....	.....	$ 6.82	1 8 0

*Francs

Domestic Prices at Works or Furnace—Last Reported			Francs		Francs		Marks	
Foundry No. 3 Pig Iron, Silicon 2.50—3.00	$16.44	3 7 6	$16.51	420(2)	$16.40	590	$17.02	74
Basic pig iron	.....	.....	17.88	455(2)	15.57	560	19.32	84
Furnace coke	3.17	0 13 0	6.09	155	5.14	185	4.95	21.50
Billets	28.00	5 15 0	19.26	490	21.96	790	25.88	112.50
Standard rails	1.74c	8 0 0	1.40c	775	1.43c	1,100	1.46c	140
Merchant bars	1.63c	7 10 0	1.00c	545	1.14c	875	1.40c	134
Shapes	1.66c	7 12 6	1.00c	520	1.12c	860	1.37c	131
Plates, ship, bridge and tank	1.82c	8 7 6	1.27c	705	1.40c	1,075	1.55c	149
Sheets, black, 24 gage	2.50c	11 10 0	2.32c	1,290	2.21c	1,700	2.29c	220
Sheets, galvanized 24 gage, corrugated	2.96c	13 12 6	4.05c	2,250	3.71c	2,850	3.65c	350
Plain wire	2.12c	9 15 0	1.62c	900	2.02c	1,550	2.03c	195
Bands and Strips	2.28c	10 10 0	1.21c	670	1.31c	1,010	1.61c	154

*Middlesbrough; †Scotch foundry iron; (1) Basic-bessemer; (2) Longway. British export furnace coke £0 13s 0d ($3.17) f. o. b. Ferromanganese £18 11s 3d ($90.40) delivered Atlantic seaboard, duty paid. German ferromanganese £15 0s 0d ($73.05) f. o. b.

The equivalent prices in American currency are in dollars per ton for pig iron, coke, semi-finished steel and rails; finished steel is quoted in cents per pound and tin plate in dollars per box. British quotations are for basic open-hearth steel; French, Belgian, Luxemburg, and German are for basic-bessemer steel.

naces, and stocks are accumulating. Fuel prices continue fairly moderate, and are not expected to go lower.

The sheet trade has had a rather dismal experience for the past two or three months, working shorter time than at any period during the year. The nominal figure of £13 12s 6d ($66.35) is generally undercut by about 2s 6d ($0.60). This trade especially in South Wales, is making large use of foreign sheet bars, obtainable at prices substantially below those of British mills. There is a marked scarcity of orders for thicker gages, with a rather better call for thin varieties. Scotland is doing rather better than South Wales. India, of late, has been a disappointing market, the small buying being attributed to the existence of heavy stocks, and a certain amount of financial embarassment.

The state of the tin plate trade still causes grave concern. The latest step is a decision to stop all the mills in the principality for three weeks during the next quarter. The stoppage will not be simultaneous, the various dates being the subject of agreement. Makers complain a good deal about the present selling figure of 17s 9d ($4.33) which, it is said, is unprofitable; but by way of stimulating buying it has been agreed to adopt this for the present, and this step has been followed by buying on a somewhat more liberal scale, users of plates having decided that no better terms are to be looked for.

The tin plate joint industrial council has decided to continue for another three months the ex-gratia bonus to workmen, allowed for some time past over the sliding scale award. The employers successfully demanded as a condition that no further claims are to be put forward by the workmen during the period. It is understood the men rather unwillingly agreed to this condition.

There is a decided lull in structural inquiry for which one explanation offered is the continued run of bad weather, which has been such a feature of the autumn, and has done much to discourage outdoor enterprises. The commonest complaint among structural engineers is that the business lately taken is cut much too finely to carry a profit. Much work is known to be pending, and is expected to come out within the next few weeks.

French Steel Prices Are Stronger

PARIS, Nov. 11.—(*European Staff Service*)— There is little change in the iron and steel market in France, and consumers maintain their reserved attitude in view of the uncertainty of the political situation, which will be cleared up only at the elections in May. There has been a current of orders from merchants and warehouses whose stocks have been depleted, and these orders have caused prices to harden to some extent. However, the tendency toward higher prices is only slight, and what is needed to sustain the market is a current of important orders. A slight rise in dollar and sterling exchange also has caused trade to pay more attention to the dispositions of the market.

Considerable importance is attached to the fact that the wire rod syndicate now is definitely formed. The French syndicate groups all orders for wire rods, both for the domestic and export markets. Prices have been maintained at the previous level. The syndicate will handle sales of wire rods ranging from 4.9 millimeters to 13 millimeters (0.2-inch to 0.5-inch), square or round, in basic bessemer or soft or extra soft open-hearth steel. Sales of rods manufactured in steel with a high tensile strength remain free, but it is agreed that the price of these descriptions must not be lower than that of soft steel. Rods used for concrete reinforcement and second quality rods are included in the agreement. It is anticipated that the organization of this syndicate is the first step toward the realization of agreements concerning other products, and conversations still are being held with regard to forming a semi-finished steel and beams syndicate.

Franc—3.92c

There has been a slight revival in the pig iron market, but no change in hematite pig iron. The Belgians recently have lowered the price of furnace coke. On the other hand, collieries in the north of France have decided to work only 23 days during November. Notwithstanding the beginning of November was marked by a holiday, the price of steel has remained firm and, in fact, semifinished steel has been slightly stronger. Beams continue weak. The average domestic price for basic bessemer blooms is 450 francs ($17.60) per ton. Billets range from 480 to 500 francs ($18.75 to $19.55). Bars range from 550 to 580 francs ($21.50 to $22.70). Beams are about 505 francs ($19.70). There has been a marked improvement in plates and heavy plates now are sold at 920 francs ($36). The price of wire rods for December and January delivery has been fixed at 725 francs ($28.40), Thionville parity.

Belgian Steel Market Is Firmer

BRUSSELS, Nov. 10.—(*European Staff Service*)—The iron and steel market is firmer, but the volume of orders continues rather small. The bad impression which resulted from delay in negotiations for the constitution of selling syndicates has disappeared. Feeling is more optimistic and the definite signing of the wire rod agreement has been met with satisfaction. The agreement was signed at Aix-la-Chapelle Oct. 27, with a retroactive effect as from Oct. 1, which means that the calculations concerning quotas and the respective situations of the members with regard to their production and sales will be based on the sales effected since Oct. 1. Until Dec. 31 the mills will be free to take orders direct, provided they quote the prices fixed by the syndicate, and at the end of the quarter the sales will be audited to straighten out the situation. The agreement is to hold good until April 1, and if at that time the international syndicate of wire product manufacturers is not reorganized, wire rod makers will be free to act independently.

Franc—2.78c

British inquiries for pig iron are becoming scarce and buyers are not prepared to pay more than £2 17s ($13.80) per ton f.o.b. Antwerp for foundry pig iron, 2.5 per cent silicon. Prices fixed by the Franco-Belge-Luxemburg entente remain as they were but they are not always applied on transactions.

Demand for blooms is small, but there have been important transactions in sheet bars, although business has somewhat declined at the beginning of the month. There is little demand for billets and most makers have withdrawn from the market, with the result that the market is untested. Basic bessemer blooms were quoted at £3 18s ($18.90), 2-inch billets at £4 5s ($20.60), 4-inch billets at £4 3s ($20.15), sheet bars at £4 6s 6d ($21.95) and skelp at £5 3s ($25).

The price of merchant bars has gradually hardened, which tends to indicate the market is considerably improving and that the present higher level is becoming firmly established. The price of beams has not followed the movement. The average quotation for bars is £4 15s ($23) f.o.b. Antwerp, concrete bars £4 10s ($21.80), nut and bolt iron £4 16s ($23.30), angles £4 14s ($22.80), beams, normal profile, £4 8s ($21.35), English profile £4 9s 6d ($21.70), 3-millimeter sheets £6 4s ($30). Inquiries have been received from South America for wire products. The domestic price in Belgium for wire products, which had been fixed by Socobelge and which remained unvariable since November, 1926, has been brought down to 1550 francs ($43.15) for bright wire as a result of the dissolution of the wire products entente.

CONSTRUCTION and ENTERPRISE

Concise Timely Business Building Opportunities from Field of Industry

North Atlantic

BRISTOL, CONN.—New Departure Mfg. Co., maker of ball bearings, etc., has awarded the general contract for a 1-story addition 51 x 91 feet to J. D. Devine, local contractor.

NAUGATUCK, CONN.—Eastern Malleable Iron Co., has taken over the plant of the Malleable Iron Works, New Britain, Conn., and will use it for a branch works.

BIDDEFORD, ME.—Bishop & Martel, operating a machine shop on Franklin street, have moved to newer quarters.

BALTIMORE—Edward Katzinger Co., 1949 North Cicero avenue, Chicago, maker of baker's tools, equipment, etc., has purchased the plant of August Maag Co., 509 West Lombard street, this city, to use for a local branch.

TAKOMA PARK, MD.—Superior Saw Co. Inc. has been incorporated with $50,000 capital by Conrad Schmidt, Benton R. Rowell and J. W. Grant.

BEVERLY, MASS.—United Shoe Machinery Co. plans to build a 4-story addition, 60 x 200 feet.

BOSTON—American Metal Specialty Co. Inc. has been incorporated with 100 shares no par value to do manufacturing, electroplating and finishing of metal products by Percy R. Seaman, 159 Hancock street.

BOSTON—L. W. Moody, 25 Willow street, will build a machine shop.

BOSTON—Boston Roofing Supply Co. has been incorporated with 1000 shares no par value stock to manufacture iron, steel and other kinds of roofing materials by Benjamin D. Levine, 1638 Commonwealth avenue.

BOSTON—Sootlas Spark Plug Co., 247 Atlantic avenue, has been incorporated with $100,000 preferred and 1000 shares no par value stock, to manufacture spark plugs and automobile parts by Roger Sherman Jr., Haverhill, Mass.

SOMERVILLE, MASS.—F. G. Volpe, Hager street, Arlington, Mass., has awarded the contract for a 1-story machine shop and foundry, 50 x 100 feet.

SOMERVILLE, MASS.—W. W. Adrian Electrical Construction Co. has been incorporated with $100,000 capital to manufacture electrical machinery, supplies and equipment by Bernard I. Clarke, Vine street, Everett, Mass.

SOUTH BOSTON, MASS.—Insulation Manufacturers Corp. has been incorporated with $90,000 capital to manufacture insulation materials, machinery, tools, etc. by Leon B. Rogers, 28 Lenox street, Newton, Mass.

WORCESTER, MASS.—M. J. Whitall Associates will build a 2-story machine shop, winding and finishing building, for which the contract has been awarded.

ASBURY PARK, N. J.—S. Schneider, 418 Main street will build a 3-story machine shop and garage, 100 x 150 feet.

NEWARK, N. J.—Kruesheld Electric & Mfg. Co., 39 Barbara street, maker of electrical equipment, will buy a new 2-story plant at Irvington, N. J., 100 x 100 feet.

NEWARK, N. J.—Jenson & Mitchell, Hoyt street and Sussex avenue, maker of automobile springs, has taken the 1-story building, 90 x 110 feet, formerly occupied by LeBlond-Schacht Motor Truck Co.

BUFFALO—Hall Aluminum Aircraft Co. will

(*Continued on Page* 1339)

Resale Equipment News

SALE of the entire assets of the Rickenbacker Motor Co., Detroit, will be made Nov. 28, 29 and 30, at receiver's auction by order of the United States district court. The sale will include two parcels of land, factory buildings and machinery equipment. The latter will include 18 engine lathes, 26 turret lathes, 28 milling machines, 53 drill presses, eight profilers, 31 grinders, five gear cutters, five air compressors, 19 arbor presses, 122 electric motors, four tapping machines, ten blowers, facing machines, spray booths, miscellaneous equipment and tools, woodworking machinery office furniture and supplies, sheet body equipment, 24 blowers and fans, and other items.

* * *

Assets of the Sterling Mfg. Co., Detroit, were sold Nov. 22 in bankruptcy. The equipment had been used in the manufacture of tools and dies.

* * *

Dennison Foundry Co., Dennison, O., has bought at court sale the plant, buildings and equipment, of the Dennison Alloy & Steel Casting Co.

* * *

Machinery and equipment of the U. S. Equipment Co., Detroit, was sold in bankruptcy Nov. 23. The machinery included several hundred iron and woodworking tools, new and secondhand.

* * *

Niles Tool Works Co., Hamilton, O., is offering for sale all its plant equipment at its Ridgway works. This consists of lathes, turret lathes, planers, shapers and slotters, drills, millers, grinders, gear cutters, boring mills, foundry, woodworking and power plant equipment.

* * *

The complete stock of mill and factory supplies and miscellaneous equipment of the C. H. Wood Co., Syracuse, N. Y., will be sold at public auction Nov. 25 by the receiver. The sale will include drills, reamers, cutters, files, belting, pulleys, welding outfits, electric drills and similar supplies

* * *

Foundry and equipment of the Canton Steel Foundry Co., Canton, O., will be sold at public auction Nov. 29, in bankruptcy. The land includes 41 acres, with substantial buildings. Equipment includes lathes, molds, patterns, ladles, traveling cranes, derricks, magnets, compressors, motors, open-hearth furnaces, tools, chains, transformers and other articles.

Sales Calendar

Nov. 25.—*Stock of mill supplies of C. H. Wood Co., Syracuse, N. Y., at public auction.*

Nov. 28—*Assets of Rickenbacker Motor Car Co., Detroit, at public sale.*

Nov. 29.—*Foundry and equipment of the Canton Steel Foundry Co., Canton, O., to be sold at bankrupt auction.*

Machinery

November Business Probably Will Equal that of October but Year Will Close a Disappointment—Planer Prices Are Increased

MAJOR machine tool and equipment markets report slight improvement during the past week but it is apparent that the bulk of the inquiries will not be closed until after the first of the year. Sentiment is improving but regardless of that December probably will close colorless. Current buying is of a scattered industrial nature with accessories more in demand than tools. The automobile industry is almost completely out of the market and likely will be until production commences on spring models. A manufacturer of planers has increased prices 10 per cent and competing builders are expected to follow the example. One milling machine maker has decreased prices 10 per cent. Used tools are in fair demand. Crane sales are light, inquiries few.

New York, Nov. 22.—Machine tool builders report an improvement in both inquiry and buying. No large lists, however, are noted, and in cranes, the situation is exceedingly dull. Railroad tool buying is spotty. It is understood that New York Central, which has a fairly sizable list pending, will take no action until after the first of the year. Delaware & Hudson is figuring tentatively, but will not bring out a formal list until the early part of next year. The brass industry is showing less interest in equipment than a month ago and the automotive also is buying sparingly. It is in a miscellaneous line of manufacture that the present improvement in interest is being shown. Export inquiry includes a list for the Kanthrapara Locomotive Works, Calcutta, India, with the department of commerce, Washington, in possession of specifications. Bids will be opened Dec. 30. C. W. Peabody & Co., this city, are inquiring for two machine tools for South America. Pratt & Whitney Co. has closed on an automatic centering machine and three 1 x 18-inch automatic lathes for an electrical company in India. Amtorg Trading Co., purchasing agent in the United States for the Soviet government of Russia, has purchased one of the latest improved tapping machines produced by Benjamin J. Mullen, Columbiana, O., to be exported for one of its iron and steel works clients.

Chicago, Nov. 22.—A number of important inquiries for machine tools have appeared in the market during the week, most of which are expected to be closed around the first of the year. Scattered industrial buying is showing a definite improvement and it is expected that the November volume of sales will at least hold its own with last month. One industrial inquiry now before the trade asks bids for at least $40,000 to $45,000 worth of tools, and several $15,000 to $20,000 inquiries are out. A Milwaukee manufacturer purchased a friction saw in this district, and industrial concerns in the Chicago district purchased several punches, a beam straightener, and lathes. Structural shop equipment was fairly active. Indiana Harbor Belt Line railroad has purchased a 32-inch shaper, and Chicago & North Western has bought a 600-ton wheel press. National Biscuit Co. has purchased a few tools. Chicago, Burlington & Quincy is inquiring for a 36-inch shaper. It is reported that at least one manufacturer of cone-type milling machines has reduced the price on this product 10 per cent.

Pittsburgh, Nov. 22.—Sentiment has improved a great deal in the machine tool, crane and equipment field, although not much actual buying has transpired this past week. Westinghouse Electric & Mfg. Co., with other manufacturers, is postponing the purchase of everything it can, but this week closed on a coping machine, a drill press, and an enameler with one seller and will shortly buy a milling machine, radial drill and shaper. Five or six manufacturers in the market for shapers have notified sellers they will not purchase this year but will close early next. Sharon Steel Hoop Co. is expected to follow up its recent purchases by the placing of additional orders soon. Two or three inquiries for three or four tools apiece developed during the past few days on which early action is expected. Now that the cranes have been ordered by McClintic-Marshall Co. for its Rankin and Pottstown, Pa., plants, the trade expects the issuance of machine tool lists. Russell, Burdsall & Ward Co., Coraopolis, Pa., are buying supplies, such as shafting, hangers, pulleys, etc., but is moving equipment from its old plant.

Worcester, Mass., Nov. 22.—The spotty situation in the tool market continues. Where one maker is producing at capacity, another in the same line is dull. There is an absence of large lists and most business is for single units and bench material. Inquiries also have slowed up and little action appears from the inquiries made some weeks ago. Railroads are buying sparingly and textiles are lower in spots. Small tools are selling fairly well. Sales this week were not large, but a list of production lathes was placed, also a radial drill and some individual units for replacement for metalworking plants, largely New England accounts. Competition is extremely keen.

Cleveland, Nov. 22.—Unless improved buying adds impetus to the local machinery market, the year promises to close in drab fashion. Isolated single tool orders constitute the only going business in major lines, although accessories are moving somewhat better. Automotive interests in both Cleveland and Detroit are almost completely out of the market and likely will not enter until after the first of the year. Manufacturing plants, likewise, are postponing action when possible. A Cincinnati planer manufacturer has increased prices 10 per cent which forecasts a similar increase by other planer builders.

CRANE ORDERS PLACED

Fourteen 5-ton hoists for manipulating grain spouts for Port of Seattle, awarded to Beebe Bros. Hand Hoist Co.

Two 25-ton electric overhead cranes for Carnegie Steel Co. Homestead, Pa., to Alliance Machine Co.

50-ton electric overhead crane for American Gas & Electric Co., New York, previously reported as informally placed, awarded to Cleveland Crane & Engineering Co.

CRANE ORDERS PENDING

Five cranes, including three 10-ton, one 35-ton and one 7½-ton, for Sharon Steel Hoop Co., Sharon, Pa.; bids all in, awards expected soon.

Two cranes for National Tube Co., Pittsburgh; bids being taken.

One power house crane to be bought by Dwight F. Robinson Co., New York, for Youngstown Sheet & Tube Co., Youngstown, O.; order expected this week.

Here and There

(*Concluded from Page* 1333)

since enactment of a law allowing foreign companies to own land in Japan. The plant will be on the dredged land, with frontage on Tokyo bay and a private canal, with highway and railroad connection.

* * *

STATEN ISLAND SHIPBUILDING CO., New York, with plant at Mariners Harbor, Staten Island, has formed a division for the manufacture of heat transfer apparatus, to be known as Heat Transfer Products Inc. George T. Jacocks is president and general manager. These products have been made by the Staten Island company for over 30 years. They include water storage heaters, feed water heaters, bleeder heaters, waste heat extractors, preheaters, condensers, evaporators, superheaters, boilers, tanks, pipes and bends, fabricated plates and galvanized products.

Iron and Manganese Ores and Minerals

LAKE SUPERIOR ORES

Iron Ore

Per Gross Ton Lower Lake Ports

Old range bessemer, 51½ per cent iron	$4.55
Mesabi bessemer, 51½ per cent iron	4.40
Old range nonbessemer, 51½ per cent iron	4.40
Mesabi nonbessemer, 51½ per cent iron	4.25

EASTERN LOCAL ORES

Cents per unit delivered at Eastern Pennsylvania and New Jersey furnaces

Foundry and basic 58 to 63 per cent	8.75 to 9.00
Copper free low phosphorus 58 to 65 per cent	nominal

FOREIGN IRON ORE

Cents per unit, alongside docks, Atlantic ports

Spanish manganiferous ore, 54 per cent iron and 2 to 4 per cent manganese	10.25 to 10.75
North African low phosphorus	11.00 to 11.50
Swedish foundry or basic, 62 to 65 per cent	9.50 to 9.75
Spanish foundry or basic, 52 to 56 per cent	9.50 to 9.75
North African foundry and basic 50 to 56 per cent	9.25 to 9.75

Manganese Ore

Prices do not include duty at rate of 1 cent per pound of metallic manganese contained.

Brazilian	36 to 38 cents
Indian	36 to 38 cents
Caucasian, 53 to 55 per cent washed	38 to 40 cents

Fluorspar

85 and 5 per cent grade

Washed gravel, Kentucky and Illinois mines, per net ton	$16.00
Washed gravel, imported duty paid eastern tidewater, per net ton	16.00 to 16.50

Construction and Enterprise

(*Continued from Page* 1337)

locate its new plant here at 2050 Elmwood avenue. The company manufactures light weight, all-metal airplanes and is under contract to furnish planes to the Navy and to various air-mail lines.

HOOSICK FALLS, N. Y.—Hoosick Machine & Tool Co. has been incorporated with $25,000 capital by E. Tiffany, Hoosick Falls, attorney.

NEW YORK—Plohr Iron Works has been incorporated with $5000 capital by C. F. Reynolds, 560 Melrose avenue, attorney.

NEW YORK—Supreme Metal Ceiling Co. has been incorporated with $2000 capital by F. Strysower, 1133 Broadway, attorney.

NEW YORK—Lexington Foundries has been incorporated with $1000 capital to do metal-working by C. Marks, 302 Broadway, attorney.

NEW YORK—Magazine Repeating Razor Co., 285 Madison avenue, maker of razors and blades, expects to increase its capitalization to provide for expansion.

NEW YORK—Hellige-Klett has been incorporated with $10,000 capital to manufacture machines and instruments by E. W. Stratmann, 41 Park row, attorney.

NEW YORK—Meyers Inventions has been incorporated with $20,000 capital to manufacture machinery by W. Karlin, 291 Broadway, attorney.

NEW YORK—Aetna Iron Works has been incorporated with $20,000 capital to manufacture iron and steel by D. O. Kuh, 36 West Forty-fourth street, attorney.

NEW YORK—Neri & Sons have been incorporated with $20,000 capital to manufacture scale boilers by A. Romano, 119 Nassau street, attorney.

NEW YORK—Sunshine Sewing Machine & Electric Corp. has been incorporated with $5000 capital to manufacture and deal in motors, by W. R. Altman, 291 Broadway, attorney.

NEW YORK—Work will be started shortly on a power house for the New York Edison Co., to be built at 701-827 East Fourteenth street. Plans have been filed by T. E. Murray, engineer, 55 Duane street.

EAST PROSPECT, PA.—An iron foundry for this city is being planned by Belson Loucks and Harry Wallick.

ETNA, PA.—Etna Forge & Bolt Co. contemplates building a 1-story plant addition.

MEADVILLE, PA.—Erie railroad, 71 West Twenty-third street, New York, W. R. Collins, purchasing agent, is inquiring for a 20-ton crane for its new shop here.

PHILADELPHIA—Lenning Bros. have closed bids through the Ballinger Co., architect, for a factory at Richmond and Kennedy streets.

PHILADELPHIA—John Warren Watson Co., maker of stabilators, has started work on its new 1-story plant, 120 x 950 feet. (Noted Sept. 15).

PITTSBURGH—Pittsburgh Water Heater Co. has completed its foundry at Idlewood, near Carnegie, almost doubling the floor space previously available in the plant.

ROSEDALE, PA.—Karl Lieberknecht Inc. has been incorporated with $250,000 capital to manufacture knitting, textile and kindred machinery, by Karl Lieberknecht and William Mayer, Reading, Pa.

SHARON, PA.—Sharon Steel Hoop Co., A. Trosk, purchasing agent, is inquiring for two 10-ton, one 7½-ton and one 35-ton crane for its new plant.

TUNKHANNOCK, PA.—Tunkhannock Foundry Co. has been established here under the management of Frank Little and Harold Cosper, to have a modern foundry and machine shop. The company is located in the building formerly occupied by the Belmont Hardware Co.

WILLIAMSPORT, PA.—Neyhart Hardware Co. has construction nearly finished on its new warehouse 32 x 200 feet.

PROVIDENCE, R. I.—Barstow Stove Co. will abandon its foundry and devote the space to assembling gas ranges. J. P. Barstow is president.

RUTLAND, VT.—F. R. Patch Mfg. Co. has awarded the contract for a 2-story machine shop and extension, 88 x 145 feet to Leo F. Caproni, New Haven, Conn.

WEST RUTLAND, VT.—Green Mountain Marble Corp., F. F. McCormack, president, has awarded the general contract for a 1-story mill, 70 x 160 feet, a 1-story shop 120 x 160 feet and a crane runway 300 feet long, to Leo F. Caproni, New Haven, Conn.

East Central

CHICAGO—Sherman-Klove Co. has awarded the contract for a 1-story machine shop to be built at 3531 West Forty-seventh street, to Poirot Construction Co., 38 South Dearborn street. (Noted Oct. 20.)

CHICAGO—Advance Pattern & Foundry Co., 2734 West Thirty-sixth place, will build a 1 and 2-story foundry 125 x 365 feet at Thirty-sixth place and California avenue. A. A. Wickland & Co., 5 South Wabash avenue, are engineers. (Noted Sept. 29).

CHICAGO—Production Gauge Co., 2019 Fletcher street, has been incorporated with 5000 shares no par value stock to manufacture internal measuring gages, etc., with William Sherman Carson, 112 West Adams street, correspondent.

CHICAGO—Russakov Can Co., Carpenter street and Ogden avenue, maker of sheet metal products, has awarded the contract for a 1-story plant, 194 x 323 feet.

EAST PEORIA, ILL.—Caterpillar Tractor Co., B. C. Heacock, manager, has awarded the general contract for a 1-story plant to the Austin Co., 510 North Dearborn street, Chicago.

MELROSE PARK, ILL.—The plant of the Mississippi Valley Structural Steel Co. is nearing completion and it is expected to be in operation within a few weeks. (Noted Sept. 29).

ROCKFORD, ILL.—Damascus Steel Products Corp. plans to build a new 1-story plant.

ANDERSON, IND.—The American Steel & Wire Co. mill being built here is nearly completed and production is expected to start sometime after Jan. 1, 1928.

EAST CHICAGO, IND.—National Terminals Co., Chicago, plans to build a rail and water transfer and terminal here, on an 85-acre tract.

FORT WAYNE, IND.—Woodard Engineering Co., manufacturer of heavy and specially

designed machines, will build a 1-story plant, 100 x 300 feet, on East Pontiac street.

FORT WAYNE, IND.—Truck Engineering Corp. East Pontiac street, maker of motor truck equipment, contemplates building a 1-story sawtooth type addition, 60 x 100 feet.

FORT WAYNE, IND.—General Electric Co. has awarded the general contract for a 1-story addition 90 x 120 feet, to the Indiana Engineering & Construction Co., Central building. (Noted Oct. 13).

FORT WAYNE, IND.—G. L. Ohmart Co., 220 Cooper building, has awarded the contract for a 1-story machine shop and service building, 35 x 150 feet, to be constructed at 340 East Berry street.

INDIANAPOLIS—Melaun Mfg. Co. has been incorporated with $25,000 capital to manufacture metal products by Herman H. Melaun, Herman W. Kothe and Eric C. Melaun.

INDIANAPOLIS—Metalcraft Mfg. Co., maker of automobile windshields, has started production in its newly established plant at 634 West Washington street.

TERRE HAUTE, IND.—Highland Iron & Steel Co., will establish a new department for the manufacture of fencing.

DETROIT—F. R. Alford Rivet & Machine Co. has been incorporated with $80,000 capital by L. Clayton Gorham, 918 Lawrence avenue.

DETROIT—Steel Tank & Mfg. Co. has been incorporated with 2000 shares no par value stock to manufacture sheet metal products by James E. Morrison, 667 Washington road.

CANTON, O.—Everhard Mfg. Co., 1592 Seventh street, N. W., maker of rubber worker's tools, flyscreens and metal specialities, plans to build a 1-story plant, 72 x 102 feet.

CANTON, O.—Linde Air Products Co., 30 East Forty-second street, New York, contemplates building a 1-story compressed gas plant here.

CLEVELAND—Metal Forming Process Inc. has been incorporated with $15,000 preferred and 100 shares no par value stock by Bert M. Wuliger, James Rosenberg and Arthur Pollack.

CLEVELAND—Bryant Heater & Mfg. Co., 17825 St. Clair avenue, has awarded the contract for two additions, 21 x 33 feet, to the J. C. S. Shafer Co.

CLEVELAND—Cleveland Gas Burner Appliance Co., 3704 Superior avenue, has awarded the contract to the Boldt-Rapp Construction Co., for a 2-story plant addition.

CLEVELAND,—Upson-Walton Co., 738 Superior avenue, maker of wire rope, cables, etc., has awarded the contract for a 1-story plant to the Austin Co.

CLEVELAND—Ohio Hoist Co. has been incorporated with $25,000 capital by Charles A. Hyde, 3065 Chadbourne avenue, Marie L. McMahon and William G. Benedict.

CLYDE, O.—Reps Stove & Heater Co., 119 Birdsey street, H. B. Reppeto, manager, recently incorporated, is inquiring for equipment including metalworking machinery etc., for proposed new plant. (Noted Nov. 10)

NILES, O.—Niles Steel Products Co. has begun construction of a new plant addition which when completed, will double its present capacity.

ST. MARYS, O.—St. Marys Wheel Co. is inquiring for 75 woodworking machines.

TIFFIN, O.—Hanson Clutch Machinery Co. has awarded the general contract for a 1-story addition 50 x 150 feet to Fred Baumgardner, Tiffin.

TOLEDO, O.—Dana Mfg. Co. has awarded the contract for its new machine shop unit to A. Bentley & Sons. It is to be a 1-story structure, 300 x 500 feet.

TOLEDO, O.—Thompson-Owens Corp., recently organized, will establish a plant for the manufacture of bronze bushings, bearings, etc.

WARREN, O.—Sunlight Electric Mfg. Co., J. B. Estabrook, president, contemplates altering its electric light plant.

YOUNGSTOWN, O.—Youngstown Sheet & Tube Co. is inquiring for three cranes for the boiler room.

YOUNGSTOWN, O.—Struthers Steel Co. has been incorporated with 250 shares no par value stock by J. W. Reavis, H. A. Marting and J. C. Little.

BARABOO, WIS.—Bids close Dec. 14 on the construction of a new high school and vocational institute. Plans are by Claude & Starck, Madison, Wis., architects. A. F. Reiner is secretary of the school board.

HUDSON, WIS.—A branch factory will be erected here by the Hudson Mfg. Co., Minneapolis. Contracts have been awarded for the building.

MILWAUKEE—J. E. Burke, manufacturer of metal weather strip, radiator screens, cabinets, etc., is about to establish a new plant in Milwaukee and transfer the main offices to this city. The present plant will continue as a branch.

MILWAUKEE—Officers of the Ajax Tool & Tie Co., 265 South Water street, are the principal incorporators of the Milwaukee Engineering & Mfg. Co., with a capital stock of $15,000, to manufacture mechanical devices and appliances. F. A. Sacherman is president, Paul H. Feiertag, secretary-treasurer, and Virgil R. Tate, general manager.

WAUKESHA, WIS.—Contracts have been awarded by the Waukesha Motor Co., manufacturing truck and industrial engines, for the erection of a 2-story plant addition, 60 x 418 feet. Harry L. Horning is president and general manager.

WAUWATOSA, WIS.—Bids close Nov. 28 on the construction of the first unit of the new Wauwatosa senior-junior high school, which will contain manual training and domestic science rooms. Architects Herbst & Kuenzli, 130 Wisconsin avenue, Milwaukee, are in charge.

WEST BEND, WIS.—The West Bend Aluminum Co., utensils, novelties, etc., is adding a full second story, 50 x 300 feet, to its main building here.

Refractories

FIRE CLAY BRICK

Per 1000 f.o.b. works

First Quality	
Pennsylvania	$43.00 to 46.00
Ohio	43.00 to 46.00
Illinois	43.00 to 46.00
Kentucky	43.00 to 46.00
Missouri	43.00 to 46.00
Maryland	43.00 to 46.00
Georgia and Alabama	40.00 to 45.00
Second Quality	
Pennsylvania	35.00 to 38.00
Ohio	35.00 to 38.00
Illinois	35.00 to 38.00
Kentucky	35.00 to 38.00
Missouri	35.00 to 38.00
Maryland	35.00 to 38.00
Georgia and Alabama	30.00 to 35.00

SILICA BRICK

Pennsylvania	43.00
Joliet, Ill., and East Chicago, Ind.	52.00
Birmingham	51.00

MAGNESITE BRICK

Per Net Ton

9 x 4½ x 2½	65.00

MAGNESITE

Per Net Ton Chester, Pa. and Baltimore base

Dead-burned grain magnesite	40.00

CHROME BRICK

Per Net Ton Chester, Pa., and Baltimore base

9 x 4½ x 2½	45.00

Western States

LOS ANGELES—Gaffers & Sattler, stove and heater manufacturing company, has awarded the contract for a foundry and machine shop to William P. Neil Co. Inc. The company is also installing a sheet metal press.

DENVER—Grimes Pipe & Supply Co. has been incorporated with $50,000 capital by David Risner, 404 Equitable building.

DENVER—Rush Pump Co. has been incorporated with 5000 shares no par value stock by James R. Young, First National Bank building, Max W. Ball and E. F. Randolph.

LAS ANIMAS, COLO.—Las Animas Specialty Mfg. Co. has been incorporated with $10,000 capital by John W. Rawlings, John Anderson and Charles H. Hassinger to manufacture metal specialties.

PUEBLO, COLO.—Frank C. Triebes, 1716 Conley avenue, has been awarded contract for construction of branch steel fabricating plant, 50 x 54 feet with addition, 16 x 96 feet, by Midwest Steel & Iron Co. of Denver. (Noted Nov. 3).

TRINIDAD, COLO.—Knecht Machinery Co. has been incorporated with $50,000 capital by Oliver M. Knecht, Hazel B. Knecht and Frank H. Hall, to deal in mining and mill machinery.

BUTTE, MONT.—Birmingham Steel & Iron Co., W. J. Crose, local manager, plans construction of warehouse. Site is being selected.

EUGENE, OREG.—Southern Pacific railroad will build a machine shop and additional track facilities here.

OLYMPIA, WASH.—Port of Olympia is erecting a combination machine shop and crane shed.

SEATTLE, WASH.—Kenworth Motor Truck Corp. has awarded to C. J. Disslar the contract for constructing a plant at Yale avenue and Mercer streets.

SEATTLE—Edwards Warehouse & Transfer Co. has acquired a site at First avenue and Massachusetts street and will build a new warehouse.

SEATTLE—Hercules Forge & Machine Works, has been incorporated with $50,000 capital

(*Concluded on Page* 1342)

On Vertical Rolls of Carnegie Steel 52" Beam Mill

1,600,000 pounds at 100 r. p. m. is the requirement. It is met by Timken Tapered Roller Bearings of 12½" bore and 25½" O. D. Compactly and simply the stresses of rolling mill operation are rendered harmless, so far as friction, thrust, shock and weight are concerned. The typical Timken savings of one-third to two-thirds in rolling mill power consumption are being verified at Homestead. The strongest possible insurance against failure has been obtained through the invincible endurance of Timken tapered construction and Timken *POSITIVELY ALIGNED ROLLS.*

THE TIMKEN ROLLER BEARING CO., CANTON, OHIO

TIMKEN
Tapered
ROLLER BEARINGS

Construction and Enterprise

(*Concluded from Page* 1340)

by W. W. Mount, 1101 Washington building, Tacoma, for A. F. Fisher and associates.

SEATTLE—Bids are being received and a contract is to be awarded shortly for furnishing pumps and electric motors to be installed in the pulp and paper plants being built at Port Townsend and Hoquiam, Wash. by the Zellerbach paper interests. Eighty electric motors and an equal number of pumps are involved.

Southern States

BIRMINGHAM, ALA.—Alabama Power Co. plans to build a 270,000-horsepower plant in Walker, Ala.

ATLANTA—Harris Machine Works 221 South Pryor street, has started to manufacture ornamental wrought iron products in addition to its regular machine shop work. T. and J. L. Harris are managers of the shop.

CHARLOTTE, N. C.—Tipton Saw Mfg. Co., recently incorporated, contemplates building a plant 50 x 97 feet. (Noted Sept. 29).

TULSA, OKLA.—County commissioners have awarded contract to Patterson Steel Co. for construction of garage and repair shop addition to present building.

CORPUS CHRISTI, TEX.—Alamo Iron Works, San Antonio, is starting construction of machine shop and foundry, 100 x 300 feet, reinforced concrete and steel construction. (Noted Nov. 3).

DALLAS, TEX.—Rufus S. Johnson, manager of Johnson Machine Works, 3001 Commerce street, plans organization of company to manufacture and repair airplanes.

DALLAS, TEX.—Gifford Hill & Co. has contract for dismantling of old Midland & Northwestern railroad, 65 miles long, from Midland to Seminole, Tex. Road has not been operated for several years.

EDCOUCH, TEX.—Edcouch Machine & Electric Co. is building 30 x 50-foot machine shop for general machine work.

Canada

NEW WESTMINSTER, B. C.—John Stokeland plans to build a shipbuilding plant on Lulu island here.

VANCOUVER, B. C.—F. F. Lang, president of the Lang Range Co., Seattle, announced that his company is planning to build a branch stove plant on Granville island here. It is understood that a site has been leased for the purpose.

BRANTFORD, ONT.—R. & S. Motors Ltd. has been incorporated to manufacture and deal in autos, motor engines, machinery, implements, etc. with $25,000 capital by William A. Ross, Mary I. Ross and Hugh S. Millar.

HAMILTON, ONT.—Hamilton Power & Transmission Co., 128 King street east, will proceed with work by day labor under the supervision of its engineering department, on the construction of a substation on Jackson street west. A number of subtrades will be let. Porter & Gardner are engineers.

KINGSTON, ONT.—Canada Glass Products, Hull, Que., which specializes in washed silica sand, has purchased the property and plant of the Silica Sand Co., near here. The company proposes to start work next spring on the erection of a modern plant on the site of the present buildings and also to build wharves so as to ship its product by water.

OTTAWA, ONT.—Arno Mines Ltd. has been incorporated to mine, smelt and refine ores, metals and minerals, with $3,000,000 capital by William N. Anger, Arthur W. Beament, and John A. Grace.

PRESTON, ONT.—Preston Woodworking Machinery Co. has let the contract for a 100 x 200-foot addition to its plant here.

SARNIA, ONT.—John Godison Thresher Co., has purchased the plant formerly occupied by the Perfection Stove Co., here. The new owners propose to add foundries, stock sheds and other buildings, according to C. A. White, secretary-treasurer.

TORONTO, ONT.—Aluminum Co. of Canada is building an addition to its plant on Sterling road. The new building will be equipped and used for a melting department.

TORONTO, ONT.—Wabi Iron Works Ltd. has been incorporated to manufacture and deal in iron, steel and other metals, with $250,000 capital and 7500 shares no par value stock by Alexander M. Fulton, Thomas H. Stinson and John E. Anderson.

New Trade Publications

TRAMRAIL—Aid to continuous operation of equipment by handling materials rapidly is the text of a leaflet by the Cleveland Electric Tramrail division of the Cleveland Crane & Engineering Co., Wickliffe, O.

GAS PURIFIER—A welded purifier for use with gas and by-product plants is featured in a leaflet by the Semet-Solvay Engineering Corp., New York. An illustration shows a typical installation and its advantages are sketched.

DUST COLLECTOR—American Blower Co., Detroit, has issued a new bulletin on collecting fly-ash and coal dust, superseding one on the same subject issued in April. Numerous installations are shown and a partial list of installations is given.

FUSE PULLER—Trico Fuse Mfg. Co., Milwaukee, presents the claims of its laminated horn fibre fuse puller and screw driver designed for safety in removing fuses and for use on small screws in sockets and similar locations.

CRANE SLING—A multiple-part sling for use with cranes is described in a leaflet by the Atlas Sling Co., Pittsburgh. It is a steel cable body designed and constructed to meet requirements of slings. Strength and lightness are emphasized.

ELECTRICAL EQUIPMENT—General Electric Co., Schenectady, N. Y., has issued several new bulletins. Included are publications on: Electrically heated tempering baths, controllers for alternating current slip-ring induction motors and ball bearing construction in general purpose motors.

JIG BORING MACHINES—Two catalogs have been issued by the Societe Genevoise d'Instruments de Physique, Geneva, Switzerland, on its jig boring machines. They are being distributed by the R. Y. Ferner Co., Washington. Illustrations and text furnish full information as to the machines and their operation.

OXYGEN JET CUTTING—A device for cutting and shaping steel of various grades and cast iron by use of the oxygen jet is featured in a circular by the Hubar-Jones Corp., New York. It is illustrated to show method of use. Data indicate time required for various operations.

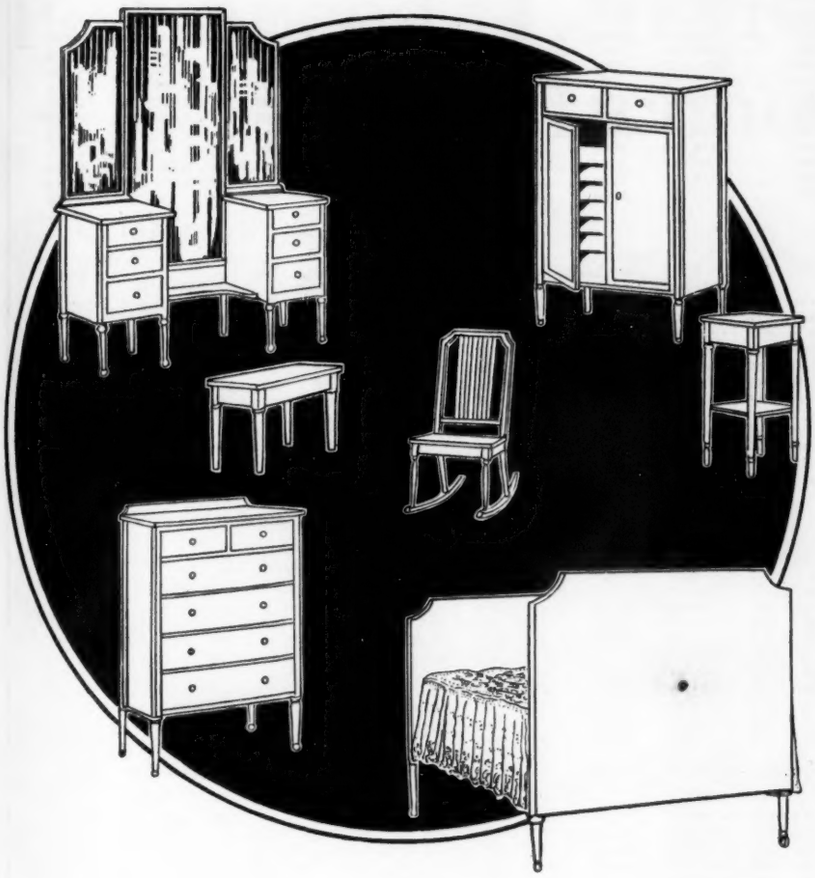
HEAT INSULATION—Philip Carey Co., Cincinnati, has issued a bulletin describing means for heat insulation at 500 to 1200 degrees Fahr. Illustrations and specifications are presented. Tables of heat losses and thicknesses of insulation under various conditions form part of the bulletin.

METAL MICROSCOPE—E. Leitz Inc., New York, has prepared a catalog on its microscope with camera for visual observation and photography of metal surfaces. Construction, operation and accomplishment are covered in text and illustrations. Its portable feature is emphasized.

IRON AND STEEL WORKER—A combination machine for working iron and steel is described in a circular by Kent-Owens Machine Co., Toledo, O. It is designed to punch, cut off and miter sections, cut off bar stock and shear flats and plates. An illustration shows the machine and details are fully described.

REFRACTORIES—John J. Moroney & Co., Chicago, has issued a catalog of its fire clay refractories. It shows standard brick and shapes carried in stock, representative standardized shapes and typical special shapes. Data tables, and information about bricks and their laying are also given. Some description of high-temperature cement, air-setting cement, firebrick mortar, plastic furnace lining and ground fire clay are included.

Furniture for the finest or simplest homes



The artistic designs and color finishes of Metal Bedroom Furniture appeal to the critical taste of the lady who lives on the drive as much as its reasonable cost appeals to the young housewife who lives in the suburbs.

Palatial homes and cozy cottages find in this type of Bedroom Furniture, *style* and *value* that make it an ideal choice for all classes of people.

There are a variety of color finishes that lend themselves to any scheme of decoration. These finishes do not chip, stain or scar. Medicine may be upset and perfume spilled on Metal Bedroom Furniture without leaving a noticeable mark. Lighted cigars or cigarettes, forgotten, will not sear it surface. Dampness nor dryness do not affect it.

Metal Bedroom Furniture requires little care, is immune to ordinary accidents of the home and retains its beautiful finish for the generations that will later inherit it.

Mansfield Metal Furniture Sheets are used extensively as the basic material in the products of the largest manufacturers of Metal Bedroom Furniture. They are rolled from Mansfield-poured ingots. This distinctive method of pouring combined with scientific treatment of the metal in the open-hearth furnace and careful tests and inspections in every step of manufacture insures a finished sheet of unusual character. Mansfield Sheets are remarkably uniform in both finish and quality.

We also manufacture Automobile Sheets, "Wabik Metal" Sheets for Vitreous Enameling, Milk Can Stock, Electrical Sheets, Pickled and Annealed Enameling Stock for Kitchen Utensils. Sheet Bars and Ingots.

MANSFIELD

METAL FURNITURE SHEETS

MASTER TEC BRAND

Mansfield Sheet & Tin Plate Company

Mansfield, Ohio

District Sales Offices:
12-237 General Motors Bldg., Detroit, Mich.
851-855 Book Bldg., Detroit, Mich.
410 Pierce Bldg., St. Louis, Mo.
1106 National City Bldg., New York, N. Y.
2002 Union Trust Bldg., Cleveland, Ohio
1504 West Venango Street, Philadelphia, Pa.

Contributing Member
SHEET STEEL
TRADE EXTENSION COMMITTEE

District Sales Offices:
1412 Merchants Bank Bldg., Indianapolis, Ind.
1020 Union Trust Bldg., Cincinnati, Ohio
640 Endicott Bldg., St. Paul, Minn.
237 Rialto Bldg., San Francisco, Calif.
509 Wilcox Bldg., Los Angeles, Calif.
1426 L. C. Smith Bldg., Seattle, Wash.

Pig Iron Production

IN GROSS TONS

Annual Statistics of Coke and Anthracite Pig Iron Compiled by American Iron and Steel Institute, Monthly Statistics, 1907 to date, by IRON TRADE REVIEW

1855	396,657	1868	1,100,893	1881	3,573,863	1894	6,434,966
1856	457,738	1869	1,361,153	1882	4,000,193	1895	9,220,967
1857	417,711	1870	1,339,284	1883	4,085,041	1896	8,311,833
1858	374,804	1871	1,363,043	1880	3,670,567	1897	9,397,469
1859	496,952	1872	2,101,760	1885	3,687,522	1898	11,477,184
1860	572,713	1873	2,045,231	1886	5,273,010	1899	13,335,937
1861	478,809	1874	1,886,479	1887	5,900,914	1900	13,404,760
1862	536,609	1875	1,656,777	1888	5,955,105	1901	15,494,913
1863	656,,785	1876	1,593,382	1889	7,028,374	1902	17,431,138
1864	798,342	1877	1,782,805	1890	8,574,558	1903	17,503,568
1865	597,536	1878	2,039,252	1891	7,702,906	1904	16,157,504
1866	918,717	1879	2,151,431	1892	8,619,379	1905	22,639,452
1867	997,576	1880	3,355,228	1893	6,737,713	1906	24,874,184

	—Stacks— No.	In	—Output— Total	Av. Daily
			1907	
January	376	311	2,174,801	70,155
February	374	308	2,047,036	73,109
March	377	304	2,186,709	70,539
April	378	327	2,226,708	74,223
May	391	329	2,291,030	73,904
June	392	341	2,237,420	74,580
July	396	335	2,253,243	72,685
August	397	329	2,243,656	72,376
September	399	329	2,174,148	72,471
October	401	314	2,359,690	76,119
November	398	226	1,820,558	60,685
December	398	154	1,234,733	39,830
Total			25,249,732	*69,177

	—Stacks— No.	In	—Output— Total	Av. daily
			1908	
January	398	139	1,081,813	34,897
February	401	150	1,086,809	37,476
March	398	154	1,229,856	39,672
April	398	146	1,155,122	38,504
May	396	145	1,168,002	37,677
June	395	154	1,106,300	36,876
July	397	166	1,228,604	39,632
August	399	181	1,366,019	44,065
September	399	189	1,416,252	47,208
October	400	200	1,573,824	50,764
November	402	212	1,582,314	52,744
December	403	221	1,723,664	55,602
Total			15,718,579	*42,947

	—Stacks— No.	In	—Output— Total	Av. Daily
			1909	
January	406	234	1,787,473	57,683
February	407	233	1,682,470	60,088
March	406	229	1,822,024	58,793
April	406	224	1,731,406	57,687
May	407	236	1,866,757	60,218
June	408	240	1,929,929	64,334
July	409	258	2,088,620	67,375
August	412	278	2,232,642	72,021
September	413	297	2,378,655	79,201
October	413	309	2,589,681	83,538
November	414	311	2,532,740	84,425
December	416	314	2,682,702	86,539
Total			25,325,099	*69,383

	—Stacks— No.	In	—Output— Total	Av. Daily
			1910	
January	416	311	2,599,995	83,871
February	417	311	2,429,525	86,768
March	417	310	2,588,736	83,508
April	418	291	2,477,700	82,590
May	419	279	2,374,802	76,607
June	420	271	2,288,279	76,276
July	420	254	2,158,124	69,617
August	422	244	2,103,791	67,864
September	420	234	2,048,461	68,282
October	421	230	2,086,205	67,297
November	421	218	1,910,385	63,679
December	421	193	1,779,899	57,416
Total			26,845,902	*73,550

	—Stacks— No.	In	—Output— Total	Av. Daily
			1911	
January	421	210	1,766,658	56,985
February	421	226	1,781,285	63,617
March	421	236	2,165,764	69,863
April	421	220	2,044,904	68,163
May	421	206	1,871,388	60,367
June	421	202	1,773,282	59,109
July	423	196	1,776,108	57,294
August	423	206	1,921,832	61,995
September	423	216	1,973,918	65,797
October	421	214	2,092,061	67,486
November	421	214	1,999,100	66,637
December	422	215	2,032,301	65,558
Total			23,198,601	*63,558

	—Stacks— No.	In	—Output— Total	Av. Daily
			1912	
January	421	227	2,052,806	66,220
February	422	235	2,098,796	72,372
March	420	237	2,411,529	77,791
April	421	239	2,377,621	79,254
May	423	243	2,503,341	80,753
June	424	242	2,433,737	81,125
July	422	245	2,402,567	77,502
August	423	255	2,500,163	80,650
September	419	262	2,444,454	81,482
October	422	280	2,683,645	86,569
November	423	289	2,639,562	87,985
December	423	291	2,777,292	89,590
Total			29,325,513	*80,124

	—Stacks— No.	In	—Output— Total	Av. Daily
			1913	
January	423	297	2,787,800	89,929
February	423	306	2,578,670	92,095
March	423	278	2,762,823	89,123
April	421	297	2,754,353	91,812
May	421	285	2,816,825	90,865
June	422	283	2,616,883	87,229
July	422	264	2,558,275	82,525
August	424	260	2,587,018	81,839
September	425	258	2,494,098	83,137
October	425	244	2,539,924	81,933
November	424	225	2,229,960	74,322
December	424	191	1,976,138	63,746
Total			30,652,767	*83,980

	—Stacks— No.	In	—Output— Total	Av. Daily
			1914	
January	423	199	1,879,336	60,624
February	423	219	1,888,607	67,450
March	423	232	2,341,551	75,534
April	422	212	2,261,501	75,383
May	422	198	2,097,019	67,646
June	422	193	1,904,566	63,486
July	422	187	1,955,324	63,075
August	422	187	1,996,483	64,403
September	422	180	1,882,718	62,757
October	422	162	1,767,227	57,007
November	421	150	1,501,269	50,042
December	421	154	1,495,325	48,236
Total			22,970,926	*62,934

	—Stacks— No.	In	—Output— Total	Av. Daily
			1915	
January	421	165	1,591,024	51,323
February	421	179	1,666,592	59,521
March	421	190	2,046,280	66,009
April	421	197	2,114,518	70,484
May	421	207	2,255,157	72,747
June	421	221	2,369,932	78,998
July	421	234	2,563,311	82,687
August	421	246	2,774,825	89,510
September	420	266	2,834,342	94,478
October	420	276	3,120,340	100,656
November	421	285	3,035,235	101,174
December	421	295	3,201,605	103,278
Total			29,573,161	*81,022

	—Stacks— No.	In	—Output— Total	Av. Daily
			1916	
January	421	304	3,171,878	102,319
February	421	312	3,078,548	106,157
March	422	315	3,327,630	107,343
April	422	320	3,225,496	107,517
May	423	321	3,364,584	108,535
June	423	325	3,213,818	107,127
July	419	316	3,221,127	103,907
August	419	317	3,197,838	103,156
September	419	326	3,208,041	106,935
October	419	328	3,508,180	113,167
November	420	322	3,317,805	110,593
December	422	309	3,184,178	102,715
Total			39,019,123	*106,609

	—Stacks— No.	In	—Output— Total	Av. Daily
			1917	
January	422	310	3,159,839	101,930
February	422	317	2,649,935	94,641
March	423	331	3,255,813	105,026
April	425	333	3,328,061	110,936
May	425	340	3,413,677	110,119
June	427	347	3,260,234	108,675
July	429	351	3,337,442	107,659
August	431	357	3,238,970	104,483
September	431	342	3,140,742	104,691
October	433	354	3,296,286	106,332
November	434	344	3,198,597	106,620
December	435	321	2,885,380	93,077
Total			38,164,976	*104,561

	—Stacks— No.	In	—Output— Total	Av. Daily
			1918	
January	435	294	2,403,227	77,523
February	435	319	2,318,242	82,723
March	438	338	3,209,996	103,548
April	437	351	3,273,355	109,112
May	437	360	3,451,884	111,351
June	437	353	3,316,148	110,538
July	437	364	3,408,584	109,954
August	439	371	3,378,479	108,983
September	438	364	3,413,223	113,774
October	437	364	3,482,392	112,335
November	437	360	3,347,844	111,595
December	435	351	3,434,114	110,778
Total			38,437,488	*105,308

	—Stacks— No.	In	—Output— Total	Av. Daily
			1919	
January	435	330	3,306,279	106,654
February	435	311	2,943,347	105,120
March	435	279	3,088,023	99,614
April	435	216	2,474,374	82,479
May	433	197	2,107,729	67,991
June	433	199	2,114,028	70,467
July	434	240	2,424,212	78,200
August	432	266	2,742,081	88,453
September	433	163	2,480,790	82,692
October	432	216	1,864,424	60,142
November	432	252	2,407,369	80,244
December	432	262	2,626,074	84,711
Total			30,578,730	*83,777

	—Stacks— No.	In	—Output— Total	Av. Daily
			1920	
January	432	285	3,012,373	97,172
February	432	305	2,984,257	102,904
March	433	315	3,375,768	108,895
April	433	278	2,752,670	91,754
May	433	297	2,991,825	96,510
June	433	302	3,046,623	101,553
July	434	291	3,043,918	98,190
August	434	306	3,145,536	101,468
September	434	317	3,124,308	104,143
October	435	290	3,288,341	106,075
November	435	255	2,935,081	97,836
December	435	202	2,700,268	87,105
Total			36,400,968	*99,456

	—Stacks— No.	In	—Output— Total	Av. Daily
			1921	
January	436	184	2,414,753	77,895
February	436	155	1,929,394	68,906
March	436	103	1,594,866	51,447
April	436	96	1,190,751	39,691
May	436	90	1,215,272	39,202
June	436	74	1,064,007	35,466
July	435	69	864,642	27,892
August	436	69	954,901	30,802
September	435	84	985,795	32,859
October	435	95	1,234,450	39,821
November	429	120	1,414,958	47,165
December	429	123	1,642,775	52,992
Total			16,506,564	*45,223

	—Stacks— No.	In	—Output— Total	Av. Daily
			1922	
January	430	127	1,645,804	53,090
February	429	139	1,630,180	58,220
March	429	155	2,035,908	65,674
April	429	161	2,070,161	69,005
May	427	175	2,309,348	74,495
June	427	191	2,362,455	78,748
July	427	170	2,403,030	77,517
August	427	143	1,810,665	58,408
September	427	189	2,024,008	67,466
October	428	218	2,629,655	84,827
November	428	241	2,846,110	94,870
December	428	253	3,083,520	99,468
Total			26,850,844	*73,563

	—Stacks— No.	In	—Output— Total	Av. Daily
			1923	
January	428	261	3,228,226	104,136
February	424	278	2,993,918	106,925
March	424	295	3,523,595	113,664
April	423	311	3,546,308	118,210
May	423	322	3,868,486	124,790
June	424	322	3,667,868	122,262
July	418	299	3,684,677	118,860
August	418	270	3,448,886	111,254
September	418	254	3,117,526	103,917
October	418	245	3,142,642	101,375
November	418	229	2,891,191	96,373
December	418	231	2,912,527	93,952
Total			40,025,850	*109,659

	—Stacks— No.	In	—Output— Total	Av. Daily
			1924	
January	414	248	3,015,480	97,273
February	414	263	3,073,619	105,987
March	410	269	3,465,389	111,787
April	410	234	3,226,107	107,537
May	411	187	2,619,986	84,515
June	411	158	2,022,836	67,427
July	411	145	1,788,457	57,531
August	411	150	1,882,986	60,741
September	411	174	2,053,617	68,454
October	411	182	2,461,727	79,410
November	411	204	2,514,979	83,832
December	411	229	2,956,389	95,367
Total			31,076,572	*84,908

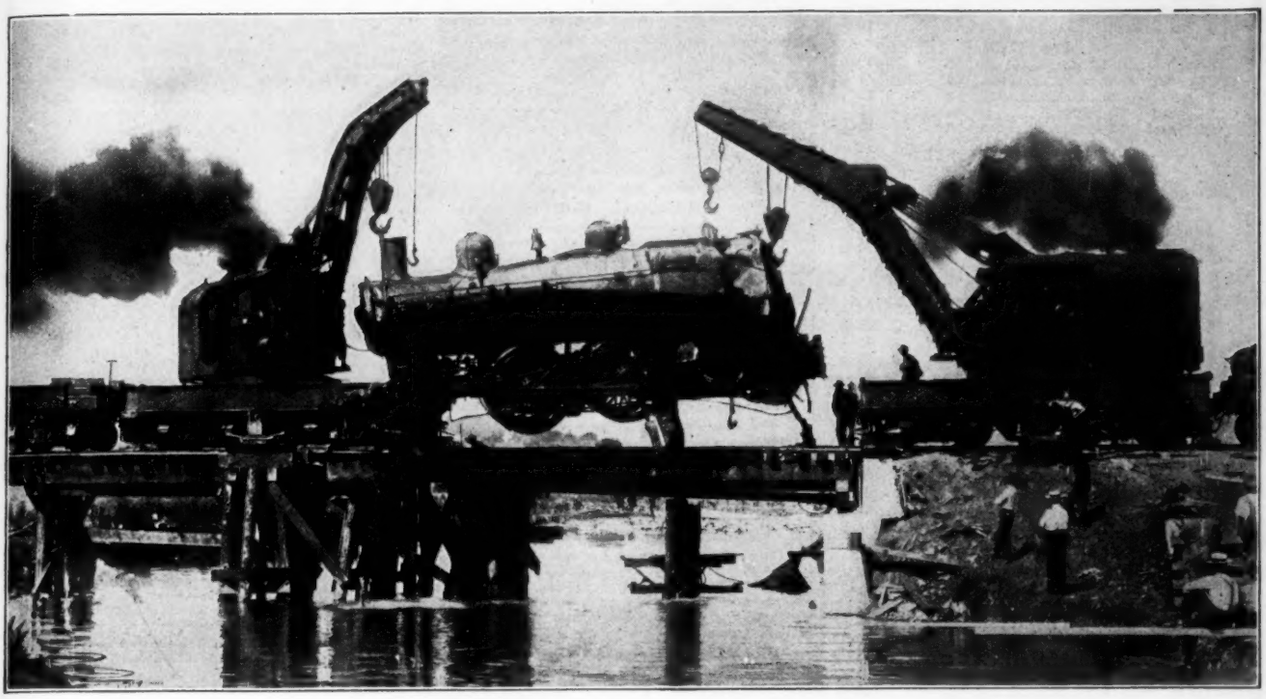
	—Stacks— No.	In	—Output— Total	Av. Daily
			1925	
January	411	251	3,372,207	108,781
February	411	256	3,214,067	114,788
March	410	246	3,571,422	115,207
April	409	221	3,211,235	107,041
May	405	196	2,933,907	94,642
June	399	191	2,679,045	89,301
July	396	188	2,665,262	85,976
August	391	192	2,707,171	87,328
September	387	200	2,725,885	90,862
October	386	209	3,017,889	97,351
November	385	220	3,023,257	100,775
December	385	234	3,249,057	104,808
Total			36,370,404	*99,645

	—Stacks— No.	In	—Output— Total	Av. Daily
			1926	
January	385	225	3,319,789	107,089
February	382	223	2,923,850	104,423
March	377	235	3,458,171	111,554
April	376	237	3,438,805	114,627
May	376	229	3,477,820	112,187
June	372	220	3,232,478	107,749
July	372	217	3,224,663	104,021
August	372	215	3,200,723	103,240
September	372	216	3,163,269	105,442
October	374	218	3,334,206	107,555
November	375	216	3,237,992	107,933
December	369	203	3,089,175	99,651
Total			39,100,941	*107,126

	—Stacks— No.	In	—Output— Total	Av. Daily
			1927	
January	369	210	3,101,346	100,043
February	369	218	2,940,604	105,021
March	365	223	3,482,107	112,326
April	364	221	3,424,377	114,146
May	363	211	3,391,067	109,388
June	362	198	3,089,726	102,991
July	362	190	2,954,625	95,311
August	362	189	2,950,674	95,183
September	362	181	2,782,500	92,750
October	361	174	2,812,015	90,712
November	.....	.....	.....	.....
December	.....	.....	.....	.....
Total	.....	.....	.....	.....

*Average

Industrial Brownhoist Cranes Set the Standard ~ ~ ~ ~ ~ ~ For Speed, Length of Service ~ ~ ~ And Economy ~ ~ ~



Industrial and Brownhoist were the originators of the locomotive crane industry in this country. Today there are thousands of these cranes in use—far more than any other make. ¶The advantages of mere numbers are unimportant, but the knowledge gained from long experience can be obtained in no other way. ¶Today Industrial Brownhoist offers you by far the most complete line of similar equipment ever manufactured by one company; locomotive cranes ranging from 7½ to 60 tons, wrecking cranes from 75 to 200 tons, and shovels of ½ to 1¼ yards capacity. ¶Getting the right crane or shovel, the one best size and type for your work, is your best guarantee of satisfactory, economical handling. And Industrial Brownhoist is best qualified to furnish this for you.

Industrial Brownhoist Corporation

General Offices: Cleveland, Ohio.

District Offices: Bay City, New York, Philadelphia, Pittsburgh, Detroit, Chicago, San Francisco, St. Louis, New Orleans.

INDUSTRIAL BROWNHOIST

Discounts and Extras

Steel Pipe

Pittsburgh and Lorain basing discounts, jobber's carloads.

Evanston, Ill., and Indiana Harbor, Ind., take differential 2 points less discount.

Chicago takes differential 2½ points less than Pittsburgh-Lorain basis.

	Black	Galvanized
Butt Weld		
⅛-inch	45	19½
¼ and ⅜-inch	51	25½
½-inch	56	42½
¾-inch	60	48½
1 to 3-inch	62	50½
Lap Weld		
2-inch	55	43½
2½ to 6-inch	59	47½
7 to 8-inch	56	43½
9 and 10-inch	54	41½
11 and 12-inch	53	40½
REAMED AND DRIFTED		
Butt Weld		
1 to 3-inch	60	48½
Lap Weld		
2-inch	53	41½
2½ to 6-inch	57	45½
EXTRA STRONG—PLAIN ENDS		
Butt Weld		
⅛-inch	41	24½
¼ and ⅜-inch	47	30½
½-inch	53	42½
¾-inch	58	47½
1 to 1½-inch	60	49½
2 to 3-inch	61	50½
Lap Weld		
2-inch	53	42½
2½ to 4-inch	57	46½
4½ to 6-inch	56	45½
7 to 8-inch	52	39½
9 and 10-inch	45	32½
11 and 12-inch	44	31½
DOUBLE EXTRA STRONG		
Butt Weld		
½-inch	42	32½
¾ to 1½-inch	45	35½
2 to 2½-inch	47	37½
Lap Weld		
2-inch	41	32½
2½ to 4-inch	43	34½
4½ to 6-inch	42	33½
7 to 8-inch	38	25½

(Note—Large jobbers obtain additional preferential discounts of 1 and 5 on black and 1½ and 5 on galvanized. These preferentials increased by one extra 5 per cent in meeting competition.

Wrought Iron Pipe

Pittsburgh basing discounts, jobbers' carloads. Individual quotations made on delivered basis.

THREADS AND COUPLINGS		
Butt Weld		
¼ and ⅜-inch	+11	+39
½-inch	22	2
¾-inch	28	11
1 to 1½-inch	30	13
Lap Weld		
1¼ and 1½-inch	Upon application	
2-inch	23	7
2½ to 6-inch	26	11
8 to 6-inch	28	13
7 to 12-inch	26	11
PLUGGED AND REAMED		
Two points less than above		
EXTRA STRONG, PLAIN ENDS		
¼ and ⅜-inch	+19	+54
½-inch	21	7
¾-inch	28	12
1 to 1½-inch	30	14
Lap Weld		
2-inch	23	9
2½ to 4-inch	29	15
4½ to 6-inch	28	14
7 to 8-inch	21	7
9 to 12-inch	16	2
DOUBLE EXTRA STRONG		
Butt Weld		
½-inch	+47½	+59½
¾-inch	+28	+40
1-inch	+34	+46
1¼-inch	+28	+40
1½-inch	+27	+39
Lap Weld		
2 and 2½-inch	+13	+25
3 and 4-inch	+ 8	+17
4½ to 6-inch	+ 9	+18
8-inch	+12	

(Note—Large jobbers obtain additional preferential discounts of 1, 5 and 2½ on black and galvanized.)

Boiler Tubes

Pittsburgh less carload discounts. Carload 4 points larger

STEEL (Lap Weld)	
2 and 2¼-inch	23 off
2½ and 2¾-inch	33 off
3-inch	36 off
3¼ to 3¾-inch	38½ off
4 to 13-inch	42 off

(Note—Additional discounts of 5 to 7 extra 5 per cents now being given.)

CHARCOAL IRON	
1½-inch	+22
1¾-inch	+12
2 and 2¼-inch	+ 2
2½ to 3-inch	3
3¾ to 4½-inch	5

(Note—Additional discounts of 2 or 3 extra 5 per cents now being given.)

SEAMLESS COLD DRAWN	
1-inch	56 off
1¼ and 1½-inch	48 off
1¼-inch	32 off
2 and 2¼-inch	27 off
2½ and 2¾-inch	35 off
3-inch	41 off
3¼ and 3½-inch	43 off
4-inch	46 off
4½, 5 and 6-inch	41 off
SEAMLESS HOT ROLLED	
2 and 2½-inch	30 off
2½ and 2¾-inch	38 off
3-inch	44 off
3¼ and 3½-inch	46 off
4-inch	49 off
4½, 5 and 6-inch	44 off

(Note—Additional discounts of 2 or 3 extra 5 per cents now being given.)

SEAMLESS STEEL MERCHANT BOILER TUBES

Extras:

Add $8 per ton for more than four gages heavier than standard and add 10 per cent to theoretical weight.

Add 5 per cent for lengths over 24 feet and not over 26 feet.

Smaller tubes than 1-inch and lighter than standard gage to be sold at mechanical tubing list and discount.

Intermediate sizes and gages not listed above take price of next larger outside diameter and heavier gage.

SEAMLESS STEEL MECHANICAL TUBING

Base Discounts on New List July 1, 1925

Carbon 0.10 to 0.20 per cent.....50 to 55 off
Carbon 0.30 to 0.40 per cent.....45 to 50 off

SEAMLESS STEEL LOCOMOTIVE AND SUPERHEATER TUBES

Net prices per foot f.o.b. Pittsburgh

Outside diameter	Gage	Price
2-inch	12-gage	14¼c
2-inch	11-gage	15c
2-inch	10-gage	16c
2¼-inch	12-gage	16c
2¼-inch	11-gage	17c
2¼-inch	10-gage	18c
3-inch	7-gage	33c
5⅜-inch	9-gage	50c
5½-inch	9-gage	52c

Plus usual extras for forming and for long lengths over 18 feet and for commercially exact lengths.

Plate Extras

BASE

Rectangular plates, tank steel or conforming to manufacturers' Standard Specifications for structural steel, dated Nov. 24, 1922, or equivalent, ¼-inch thick and over on thinnest edge, (except for ¼-inch or 72 inches wide when ordered to weight in pounds per square foot—see width and gage extras), 100 inches wide and under, down to but not including 6 inches wide, 5 feet 0 inches long up to published limit in length but not over 80 feet 0 inch, are base. Extras per pound for width or diameter.

All Plates, Rectangular or Otherwise

¼-inch thick and heavier, but not less than 11 pounds per square foot, if ordered to weigh—

Over 100 inches to and including 110 inches	.05c
Over 110 inches to and including 115 inches	.10c
Over 115 inches to and including 120 inches	.15c
Over 120 inches to and including 125 inches	.25c
Over 125 inches to and including 128 inches	.50c
Plates less than ¼-inch or lighter than 11 pounds per square foot.	
Over 72 inches to and including 84 inches	.10c
Over 84 inches to and including 96 inches	.20c
Over 96 inches to and including 100 inches	.30c
Over 100 inches add .35c to width extras for plates ¼-inch thick and heavier.	

GAGE

Plates not Exceeding 72 Inches Wide

Plates less than ¼-inch gage, to and including 3/16-inch; or lighter than 10.2 pounds per square foot, to and including 7.65 pounds per square foot .20c

Plates over 72 Inches Wide

Plates less than ¼-inch gage, to and including 3/16-inch; or lighter than 11 pounds per square foot, to but not including 7.65 pounds per square foot. 20c

Plates ordered 7.65 pounds per square foot .30c

QUALITIES

Pressing steel	.10c
Flange steel (boiler grade)	.15c
Ordinary firebox steel	.20c
Stillbottom steel	.30c
Locomotive firebox steel	.50c
Marine steel	1.50c
Hull materials subject to U. S. Navy Dept. Specifications for Medium or Soft Steel	.10c
High tensile hull steel subject to U. S. Navy Dept. or equivalent specifications	1.00c
Boiler steel subject to U. S. Navy Dept. Specifications, classes A and B	1.50c
Hull plates to hull specifications, required to stand cold flanging, take extra for flange steel.	

Floor Plates

Checkered plates..... 1.75c

Checkered plates are not furnished to sketch and are rolled from "Stock Steel" only. No physical tests will be made on checkered plates.

INSPECTION

Mill inspection.....No extra

Charges for other inspection, such as Lloyd's or American bureau of shipping, will be made by inspection bureau direct to buyer.

CUTTING

LENGTH OR DIAMETER

All Plates, Rectangular or Otherwise

Five feet and over up to published limit of length, but not over 80 feet	No extra
Under 5 feet to 3 feet inclusive	.10c
Under 3 feet to 2 feet inclusive	.25c
Under 2 feet to 1 foot inclusive	.50c
Under 1 foot	1.55c
Over 80 feet to 100 feet inclusive	.10c

Over 100 feet add .25c plus .05c for every additional 2 feet or fraction thereof.

Regular Sketches

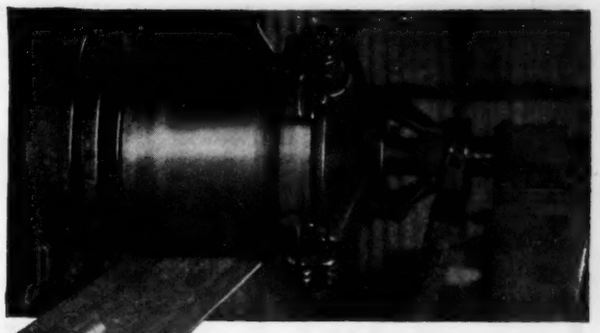
With not more than four straight cuts. (Including straight taper plates)

Additional extra ..... .10c

Irregular Sketches

With not more than four straight cuts. (Sketches cannot be sheared with reentrant angles)

Additional extra ..... .20c



This Belt Stretcher casting measures 2¼ inches thick at the center and tapers down to ¼ inch thick at the ends —and is cast in Sivyer Electric Steel.

Great Strength in Thin Sections where Strength Is Needed

To successfully cast thin sectioned parts, demanding uncommon strength, requires foundry practice above the average.

It demands anticipation of shrinks, cracks and strains by careful heading and gating. It necessitates pouring these parts in metal that is clean, solid and close-grained. These things insure fewer machining rejections and fewer replacements in the field.

The belt stretcher shown above is a typical example of such parts cast in Sivyer Steel.

Sivyer has prepared a 54-page book on Steel Casting Patterns to help manufacturers standardize their pattern equipment to obtain more uniform castings. It is a complete work on its subject in which you will be interested. The Sivyer Alloy book is still current. A copy of either may be had for the asking.

SIVYER STEEL

SIVYER STEEL CASTING COMPANY, MILWAUKEE

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ACCUMULATORS
Birdsboro Steel Foundry & Machine Co., Birdsboro, Pa.
Logemann Brothers Co., 3126 Burleigh St., Milwaukee, Wis.
United Engineering & Foundry Co., Farmers Bank Bldg., Pittsburgh, Pa.
Wood, R. D., & Co., 400 Chestnut St., Philadelphia, Pa.

ACETYLENE (Dissolved)
International Oxygen Co., Newark, N. J.
Prest-O-Lite Co., The, 30 E. 42nd St., New York City.

ACETYLENE GENERATORS
Air Reduction Sales Co., 342 Madison Ave., New York City.
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Air Reduction Sales Co., 342 Madison Ave., New York City.
International Oxygen Co., Newark, N. J.
Prest-O-Lite Co., The, 30 E. 42nd St., New York City.

ACIDS (Pickling)
American Chemical Paint Co., Ambler, Pa.

ADAMITE ROLLS
American Adamite Co., The, 12th and Etna Sts., Pittsburgh, Pa.

AIR COMPRESSORS—See COMPRESSORS (Air)

AIR FILTERS
Midwest Air Filters, Inc., Bradford, Pa.

ALLOYS
Electro Metallurgical Sales Corp., 30 E. 42nd St., New York City.
Lavino, E. J., & Co., Bullitt Bldg., Philadelphia, Pa.
Metal & Thermit Corp., 120 Broadway, New York City.
Titanium Alloy Mfg. Co., Niagara Falls, N. Y.
Vanadium Corp. of America, 120 Broadway, New York City.

ALUMINUM (Vanadium)
Vanadium Corp. of America, 120 Broadway, New York City.

ALUMINUM
Summerill Tubing Co., Bridgeport, Pa.

ANGLES, TEES, CHANNELS—See STEEL (Structural)

ANNEALING BOXES
Farrell-Cheek Steel Foundry Co., Sandusky, O.
Pittsburgh Annealing Box Co., 801 Beaver Ave., N. S., Pittsburgh, Pa.
Riter-Conley Co., Oliver Bldg., Pittsburgh, Pa.
Smith, George H., Steel Casting Co., Milwaukee, Wis.
Union Steel Casting Co., 62nd and Butler Sts., Pittsburgh, Pa.
United Engineering & Foundry Co., Farmers Bank Bldg., Pittsburgh, Pa.

APPRAISALS
McKee, Arthur G., & Co., 2422 Euclid Ave., Cleveland, O.

AXLES
Bethlehem Steel Co., Bethlehem, Pa.
Carnegie Steel Co., 431 Carnegie Bldg., Pittsburgh, Pa.
Champion Machine & Forging Co., The, 3675 E. 78th St., Cleveland, O.
Illinois Steel Co., 208 So. LaSalle St., Chicago, Ill.
National Tube Co., Frick Bldg., Pittsburgh, Pa.

BABBITT METAL
Cadman, A. W., Mfg. Co., 2816 Smallman St., Pittsburgh, Pa.

BALING PRESSES
Logemann Brothers Co., 3126 Burleigh St., Milwaukee, Wis.

BANDS AND HOOPS (Galvanized Strips)
Sharon Steel Hoop Co., Sharon, Pa.

BANDS (Iron)
Bethlehem Steel Co., Bethlehem, Pa.

BANDS (Welded Iron and Steel)
Akron-Selle Co., Akron, O.

BAR BENDERS
Kardong Bros., 346 Buchanan St., Minneapolis, Minn.

BARGES (Steel)
American Bridge Co., 71 Broadway, New York City.

BARRELS (Steel)
Cleveland Wire Spring Co., The, 1281 E. 38th St., Cleveland, O.

BARROWS
Sterling Wheelbarrow Co., Milwaukee, Wis.

BARS (Alloy)
Bourne-Fuller Co., The, 1912 Scranton Rd., Cleveland, O.
Central Alloy Steel Corp., Massillon, O.
Donner Steel Co., Inc., P. O. Box 1000, Buffalo, N. Y.
Wheelock, Lovejoy & Co., Inc., 128 Sidney St., Cambridge, Mass.

BARS (Concrete Reinforcing)
Bethlehem Steel Co., Bethlehem, Pa.
Bourne-Fuller Co., The, 1912 Scranton Rd., Cleveland, O.
Donner Steel Co., Inc., P. O. Box 1000, Buffalo, N. Y.
Franklin Steel Works, Franklin, Pa.
Gulf States Steel Co., Brown-Marx Bldg., Birmingham, Ala.
Laclede Steel Co., Arcade Bldg., St. Louis, Mo.
Migret, Rene, 7 Boulevard Defontaine, Charleroi, Belgium
Ryerson, Jos. T., & Son., Inc., 16th and Rockwell Sts., Chicago, Ill.

BARS (Iron and Steel)
Andrews Steel Co., Newport, Ky.
Bethlehem Steel Co., Bethlehem, Pa.
Bourne-Fuller Co., The, 1912 Scranton Rd., Cleveland, O.
Lockhart Iron & Steel Co., Pittsburgh, Pa.
Morris, Wheeler & Co., 30th and Locust Sts., Philadelphia, Pa.
Penn Iron & Steel Co., Creighton, Pa.

BARS (Steel)
Bethlehem Steel Co., Bethlehem, Pa.
Bliss & Laughlin, Inc., Harvey, Ill.
Bourne-Fuller Co., The, 1912 Scranton Rd., Cleveland, O.
Carnegie Steel Co., 431 Carnegie Bldg., Pittsburgh, Pa.
Central Alloy Steel Corp., Massillon, O.
Donner Steel Co., Inc., P. O. Box 1000, Buffalo, N. Y.
Franklin Steel Works, Franklin, Pa.
Illinois Steel Co., 208 S. LaSalle St., Chicago, Ill.
Illinois Steel Warehouse Co., 1319 Wabansia Ave., Chicago, Ill.
Inland Steel Co., First National Bank Bldg., Chicago, Ill.
Jones & Laughlin Steel Corp., Pittsburgh, Pa.
Keystone Drawn Steel Co., Spring City, Pa.
Migret, Rene, 7 Boulevard Defontaine, Charleroi, Belgium
Pacific Coast Steel Co., Rialto Bldg., San Francisco, Calif.
Republic Iron & Steel Co., Youngstown, O.
Ryerson, Jos. T., & Son, Inc., 16th and Rockwell Sts., Chicago, Ill.
Tennessee Coal, Iron & Railroad Co., 1351 Brown-Marx Bldg., Birmingham, Ala.
Youngstown Sheet & Tube Co., Youngstown, O.

BARS, STEEL (Electric Furnace)
Timken Roller Bearing Co., The, Canton, O.

BEAMS, CHANNELS, ANGLES, ETC.
Bethlehem Steel Co., Bethlehem, Pa.
Blystone Mfg. Co., Ironton St., Cambridge Springs, Pa.
Carnegie Steel Co., 431 Carnegie Bldg., Pittsburgh, Pa.
Illinois Steel Co., 208 So. LaSalle St., Chicago, Ill.
Inland Steel Co., First National Bank Bldg., Chicago, Ill.
Jones & Laughlin Steel Corp., Pittsburgh, Pa.
Migret, Rene, 7 Boulevard Defontaine, Charleroi, Belgium
Phoenix Iron Co., The, 20 So. 15th Philadelphia, Pa.
Ryerson, Jos. T., & Son, Inc., 16th and Rockwell Sts., Chicago, Ill.

BEARINGS (Ball)
Hoover Steel Ball Co., Ann Arbor, Mich.
New Departure Mfg. Co., The, Bristol, Conn.
Norma-Hoffmann Bearings Corp., Stamford, Conn.

BEARINGS (Journal)
Cadman, A. W., Mfg. Co., 2816 Smallman St., Pittsburgh, Pa.
Hyatt Roller Bearing Co., Newark, N. J.
Timken Roller Bearing Co., The, Canton, O.

BEARINGS (Motor)
Hoover Steel Ball Co., Ann Arbor, Mich.
Hyatt Roller Bearing Co., Newark, N. J.
Norma-Hoffmann Bearings Corp., Stamford, Conn.

BEARINGS, (Oilless)
Rhoades, R. W., Metaline Co., Inc., Rhoades Bldg., Long Island City, N. Y.

BEARINGS (Roller)
Hoover Steel Ball Co., Ann Arbor, Mich.
Hyatt Roller Bearing Co., Newark, N. J.
Norma-Hoffmann Bearings Corp., Stamford, Conn.

BEARINGS (Tapered Roller
Timken Roller Bearing Co., The, Canton, O.

BEARINGS (Thrust)
Hoover Steel Ball Co., Ann Arbor, Mich.
Norma-Hoffmann Bearings Corp., Stamford, Conn.
Timken Roller Bearing Co., The, Canton, O.

BELT FASTENERS
Bourne-Fuller Co., The, 1912 Scranton Rd., Cleveland, O.

BENCHES AND FRAMES (Drawing)
Morgan Construction Co., Worcester, Mass.

BENCHES AND FRAMES (Wire Drawing)
Vaughn Machinery Co., Cuyahoga Falls, O.

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